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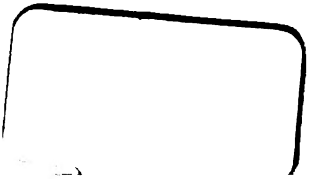

SAFEGUARDING RAILWAY EXPENDITURES

INCLUDING MATERIAL AND SUPPLIES, LABOR, OPERATING EXPENSES, CONSTRUCTION, TAXES, INTEREST ON BONDS, SINKING FUNDS, DIVIDENDS AND MISCELLANEOUS DISBURSEMENTS

FORMING ONE OF THE SERIES OF VOLUMES COMPRISED IN THE REVISED AND ENLARGED EDITION OF

THE SCIENCE OF RAILWAYS

BY

MARSHALL M. KIRKMAN

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INTRODUCTION.

SAFEGUARDING CORPORATE EXPENDITURES.

While what is written herein refers directly to railways, it also applies to all corporations, public and private. Corporate affairs require to be organized along impersonal lines and so managed that their resources cannot be frittered away; value must be received in every instance. It matters little how much a corporation earns if there is not careful handling of its resources and faithful and scientific accounting connected with its expenditures. To secure this, safeguards are required to be thrown around every phase of operation. In corporate life it is not only necessary that men should be honest, but that they should be able to prove it. This requires that every phase of business involving expenditure should come within the cognizance and approval of coordinate and independent departments. This may be accomplished without multiplying methods or increasing cost. No one can give the subject thought without being impressed with its vastness and supreme importance. This is better understood now than formerly, and just appreciation of it grows each year.

CHAPTER I.

ECONOMIC SAFEGUARDS SURROUNDING RAILWAY EXPENDITURES, WITH SOME REFERENCES TO PRACTICES IN OTHER COUNTRIES, AND AN EXPOSITION OF UNITS OF SERVICE AND COST.

There is no feature connected with the operation of railroads of greater importance to the owner, whether it be the State or private parties, than the enforcement of carefully considered and scientific methods in connection with the expenditures of these great properties. This is nowhere so fully appreciated perhaps as in America, for in no other country are expenditures so patiently scrutinized or so intelligently regulated.

In every country save the United States great importance is attached to what is termed the annual budget: that is, a forecast or estimate of what the disbursements of the property will be for a given time, usually for one year in advance. In some cases the expenditures thus forecasted cannot be exceeded, or if some latitude is allowed, it is in regard to outlays connected with the working expenses which could not have been foreseen, such as some unexpected calamity or an unanticipated growth of business. No exception is, however, made even in such cases on roads operated by the State. In the case of these properties, the limit of outlay is carefully itemized and restricted by law in the annual appropriation bill or budget of the Government. The discretion of those managing the railway is thus reduced to the minimum; in fact practically negatived.

In the improbable event, an outlay is incurred, on the initiative of the management, in excess of the prescribed limit, it must be provided for in a subsequent law passed to cover the same. Thus the management is effectually handicapped if actual conditions, as they arise, do not harmonize with preconceived ideas; and yet all who have anything to do with the operation of railroads know that such exigencies are of frequent and marked occurrence.

In order, therefore, that, under such conditions, a railroad shall not be crippled in its affairs or competitive business, it cannot but be true that the annual forecast must, as a precautionary measure, be heavily padded; or, in other words, such an amount must be smuggled into the budget as experience suggests as possibly necessary to enable the management to meet the unexpected vicissitudes of business without crippling the property or having its business frittered away for lack of needed expenditure. And it must naturally follow, that, wherever such subterfuge is practiced, it cannot but result in extravagance and waste; for Government officials, being but men, are more concerned in living within prescribed limits than, by rigid economy and careful foresight, in saving any portion of the amount allotted them.

From whatever point of view, therefore, that the subject is considered, it is deplorable. Another objectionable feature, however, is that it deprives the management of the power and stimulus of initiative, and thus losses cannot but occur through the failure of the State to avail itself of the skill and endeavor of its servants as emergen-

cies arise. However, in the absence of the selfish and enlightened supervision exercised by private ownership, it is probable that no more satisfactory system is possible in the case of State management—where everything, including the law, begins and ends with employes and, consequently, only the perfunctory interest and intelligence of employes can be expected. It would seem, however, as if one of the drawbacks, inseparable from such a system, might be mitigated by the State making provision in the annual budget for a contingent fund for each railway unit to meet unexpected emergencies, the use thereof to be explained and itemized in a special report to the Government. Thus the incentive to smuggle fictitious amounts into the railway budget to meet emergencies would be obviated and the integrity and responsibility of the management enhanced.*

Restrictions surrounding the annual budget are less drastic in the case of European railroads operated by private corporations than in the case of those managed by the State. In the administration of the former, the owners generally and wisely avail themselves of the experience, fidelity and intelligence of those in charge, looking to them to meet the emergencies of the hour by reductions or increased outlays as the circumstances of the case require.

It is probable that every railroad company attempts, with more or less particularity, to forecast its outlays for the coming year; and, in many cases, the budget thus compiled wisely and safely

* However, no such provision is made. Thus the Belgian constitution, which may be said to be typical, provides arbitrarily that "the Chambers pass an act for the accounts and vote the budget. All receipts and expenses must be shown in the budget and in the accounts."

prescribes certain expenditures within defined limits, such as the largest salaries, important improvements, new equipment, and so on. These are, however, subject to revision at any moment. Moreover, these forecasts are made, in the case of private companies, at a time when the revenues for the coming year can, because of business conditions and the success or failure of the crops, be estimated with appreciable certainty. On the other hand, it is apparent that forecasts made simultaneously for a great country, as in the case of France, cannot be intelligently compiled by many important railroads. In other words, at the time of making the estimates, (an arbitrary date being prescribed for all by the State), the management has not the data at hand for forecasting the future intelligently and so the budget must of necessity be simply a guess in the dark; or, at best, based on the preceding year's operations.*

The estimates for the Belgian state railroads are made on the 31st of October, two months before the commencement of the operating year, January 1st! Similarly, a wide margin is of necessity required in the case of the budget for the State railroads of other countries. Rigid adherence to the provisions of the law fixing the amount of expenditures is all that is expected or required by the State; and as the State is responsible to no one, it follows that its exhibits of ex-

* "Estimates (for the state railroads) are based, mainly, on the operations of the preceding financial year, which are not always charged to the account for the respective financial year, for the simple reason that the settlement could not be effected within the statutory time-limit for closing the annual account." Regulations Russian state railroads.

"Estimates may be considered as an absolute limit, not only as a whole but also as regards individual items which may not be exceeded." Chevalier Von Loehr, Imperial Royal Government Counselor, Austria.

penditures are full or meager, according as the provisions therefor are adequate or otherwise. And as the stability of cabinets, nay of State management of railroads, may at any moment depend upon the measure of efficiency exercised in the administration of State roads, it follows that information needed to form intelligent judgment thereof, will be and is, in fact, too often withheld by the Government. And this will always be the case until governments operating railroads are compelled to particularize operations and state results with the perspicuity that private owners demand of their servants. Then, and not until then, will we know the full measure of State inefficiency, and how far such management falls below that of private ownership and control.* The Belgian government, to illustrate the evasion referred to above, contents itself in its exhibits with giving the bare totals of expenditures chargeable respectively to capital account and operation. There is no statutory obligation requiring it to furnish details and none are given, and the taxpayer and seeker after information are left completely in the dark as to the measure of efficiency exercised in the different departments and branches of the service. What would the pri-

* The State railways of Belgium, owing to the compactness of the country and the intelligence and skill of those in charge, are operated, it is believed, as economically as those of any similar system in the world. Nevertheless, referring to governmental management, the Director General of Belgian Railways, M. C. de Burlet, says:

"The State railroads in Belgium, as would be the case anywhere else, lack the real incentive for economical management which is, of course, self interest; * * there is a failure under public operation to * * avoid a high rate of expense which is the one great aim under private ownership. * * There is a tendency under any government toward a multiplicity of employes and there is less avoidance of unnecessary expense than in the case where the private owner has his own profits constantly in view and knows that every dollar of expense and every unnecessary employe must be paid for out of his own pocket."

vate owners of a railroad say or do if their manager presumed to make so meager a report concerning interests of such supreme importance to them and to the community generally?

Moreover, the practice enforced more or less generally in the case of State railroads, of charging the amount of material purchased and contracts entered into, to the budget for the year in which the obligation is incurred rather than that in which the material is used or the contract executed, would, of itself, prevent anything like accurate knowledge of actual outlay for any particular period.

In the case of American railroads (United States, Canada and Mexico), where it is no boast to say that railway administration has met with unprecedented success—both as regards construction and operating—a wide margin of discretion is allowed the management of every property in the case of expenditures. It is everywhere recognized and acted upon that railways cannot be operated effectively and with the greatest degree of economy unless the local management is authorized and encouraged to make such increased outlays, to meet current needs, as the exigencies of the service require; or, on the other hand, through the responsibility placed upon it, to meet possible retrenchments by cutting down expenses in every direction if falling off of business or other occurrences render such curtailment possible.

It is apparent from a study of the methods of railroads in other countries that Americans utilize their department of accounts to a much greater extent than elsewhere as a far-reaching

safeguard and authoritative source of information. For here all the results, including exhibits of operations, are consolidated in one department under a responsible head, subordinate only to the executive or board of control, thus attaining both economy and accountability. On the other hand, many of the railroads of the Old World are still operated under primitive methods, the accounts being scattered through various departments and bureaus to the great enhancement of cost and lack of skilled effort and effective accountability.*

The discretion allowed railway managers in America to increase expenditures, as occasion requires, does not imply any waiving of responsibility or laxity in accounts regarding such outlays in the returns made to the stockholders and the State. Every expenditure for wages and material, or for any other purpose, is verified and scrupulously portrayed by the accounting officer.

In regard to disbursements of cash in the

* J. de Richter, connected with the Russian State Railway system, referring to this aspect of the subject, says "The historical type of the Russian railways is characterized by a series of institutions subordinate to each other in hierarchical order, being entrusted with what may be termed parallel bookkeeping, subject to a progressive summarizing of the entries. This decentralizing system involves, in the opinion of many, a constant impediment to the dissection and proper apportionment of expenditures, on account of the very natural tendency of the administrative and executive authorities to group together the vouchers and returns arbitrarily, according to preconceived notions." The prolixity that characterizes the Russian State systems is noticeable everywhere in connection with governmental management. "As regards the system in use on the State and private railway systems, it constitutes a marked and a very pronounced or compound decentralization in the expenditure department. * * * * * This complication is principally due to the mode of sanctioning expenditure and to the necessity for drawing up, for each grade in the hierarchy, statements showing the credits open to each superintendent, head of section or manager of works by the requirements of the budget statistics."—Ibid. This peculiarity of organization is not confined to the Russian State railroads, but is to be found in an aggravated form on the State roads of Austria, Belgium, Italy, France and, indeed, generally throughout Europe.

United States, all payments are made or directed from one centralized office, an audited voucher being required and a receipt taken in every case. These vouchers are filed in numerical order with the general accounts of the company, where they may be found at a moment's notice. All payments, moreover, when practicable, are re-enforced by evidence of payment as shown by the draft or bank check covering the same. Indeed, it may be said to be the rule upon American railroads, to pay all except petty station accounts by check, thus necessitating the identification of the payee before a disinterested and responsible authority.

In this connection it is curious to note that some of the great European companies still make as many vouchers to cover a payment as there are accounts to be charged therewith, instead of making one voucher or one entry on the pay-roll and indicating in connection therewith the various accounts affected and the amount to be charged to each. These ancient practices, involving unnecessary clerical work and liability to confuse and duplicate accounts, it is gratifying to know, are not universally followed. However, the desirability, as a simple measure of safety and economy of work, that a man's name shall not appear but once on the pay-roll or be embraced in more than one voucher, monthly (or as often as payments are made), is still disregarded upon many European roads.* Nor

* "For instance" (in the Latin nations), "the salary of one individual official may be distributed among several chapters; may even necessitate several vouchers, and this makes it quite impossible to supervise the pay received by each individual employe and gives every opportunity for fraud. Moreover they very much increase the magnitude of accounts and consequently incur more work and more expense." —Chevalier Von Loehr.

can it be truly claimed in excuse that concentration of accounts payable does not adapt itself as easily and properly to the fixed budget of State railroads as to other properties. Under such method any expenditure, whether within or without the pale of the budget, can be particularized and made the subject of separate report if necessary and so no measure of accountability or procedure will be lost.

Accountancy, as it is delicately termed on the Continent, is, in its practical and scientific application, an unknown quantity abroad, its great and particular value being neither generally understood nor appreciated. And curiously enough its great European exemplar, a man of talent and varied accomplishments, is indeed, really a civil engineer by profession and training and has the same redundant knowledge of the niceties and true purposes of accounts that an American accountant has of civil engineering! It is also noticeable that all the acts and thoughts of those who have to do with the accounts of railway expenditures on the Continent, are colored and influenced by that economic microbe, the budget. It influences all they do and paralyzes every effort so far as scientific methods and illustrative exhibits of value are concerned.*

It is generally recognized that safeguards are necessary to secure trustworthy returns of labor and supplies; that work paid for shall have been

* "State accountancy, being principally intended as a check in the carrying out of the budget, concerns itself, generally speaking, only with the transactions of the finance offices, the sole media in the final settlement. * * * * It is, therefore, the budget which governs the accountancy."—J. de Richter.

performed as claimed and that material shall have been received and inspected by the storekeeper. Similar accountability is also deemed necessary in regard to contracts. These elementary principles are everywhere admitted, but the degree of efficiency and economy exercised in their discharge varies greatly with different companies. Uniformity of method, it should be understood, is not practiced in connection with the keeping of the accounts of railways any more than in other departments of the service. Nor is it important that it should be. Directly the contrary. Systems are dependent for their efficacy upon conditions and the character and talents of those in charge; so that methods that may be enforced with success and economy upon one road or by one management, would be found lacking upon another. There are, however, certain fundamental safeguards that should be thrown around the disbursements of railroads and that can, in no case, be safely omitted. This is especially true in regard to the enforcement of contracts, accountability for supplies, and in the minute scrutiny that must be exercised in keeping the time of men, in distributing the same to the allotted accounts and, finally, in making the pay-roll and discharging the same.

In perfecting a system of accounts covering the expenditures of railroads, it is important that the information required by the management concerning the operations of the property, should be kept in mind, so that, so far as practicable, the accounts and returns shall be so arranged and compiled that they will not only serve as a means of auditing, but will afford the data the management requires to scrutinize and verify its

measures. Exhibits of expenditures for operating and other current purposes, should be compiled as soon after the end of the month as practicable; and, furthermore, on American roads, it is the practice to show the receipts of the property in connection therewith, so that both outgo and income being brought together results may be quickly and fully scanned by those interested therein. This concentration is of importance and should be observed for the reason that those responsible for operations are fully occupied in the management of the property and so should not be diverted therefrom by being required to make unnecessary researches in order to ascertain the measure of success that has attended their efforts.

This unification of returns and similar advantages in other important directions is one of the admirable results that has attended the consolidation of accounts in one department on American roads and may be advantageously followed in other countries whether the roads are administered by the State or private parties.

The rules and regulations that must, in one form or another, be universally enforced in order to secure effective responsibility in connection with the disbursements of railways, are of vital interest to railroad owners and managers, but their immediate discharge particularly concerns the myriad of men in subordinate positions actively engaged in one way or another in the procurement, care and use of material; in keeping the time of men, paying therefor, and in connection with the other sources of outgo that attend the operation of a railroad. Properly, they should minutely describe and, by the aid of

forms, portray practicable methods of accounting, the purpose of which will be to enforce responsibility and prevent waste or fraud, and at the same time afford the local management (through whose hands these returns should pass on their way to headquarters) immediate information in regard to details and results of current operations.

Referring again to the intervention of the State in connection with the accounts of railroads, it may be truly said that the work of the Interstate Commerce Commission of the United States is, in this regard, superior to that of all other countries in the completeness and clearness with which expenditures and receipts are stated. Under its carefully prepared formulas—formulas which the accounting officers of the railroads actively assisted in compiling—the affairs of every company may be scrutinized with the utmost particularity and their condition and the details of operation accurately determined. Thus, in the case of railway disbursements, the operating expenses are divided under a carefully prepared classification covering fifty-three distinct heads. Construction work, chargeable to capital account, is divided under forty heads and, as in the case of operating expenses, every outlay that invites interest or inquiry is carefully particularized. For other railway expenditures of a miscellaneous nature there are eleven subdivisions.* This

* These classifications, subdividing the disbursements of a railway, are the lenses through which, by comparison and otherwise, expenditures are scrutinized; and while the Interstate Commerce Commission's classification is unusually full, from a governmental standpoint, it is still further elaborated by many railroads, expenditures being dissected and subjected to such further analysis and comparison as circumstances require or ingenuity suggests.

admirable exploitation of railway expenditures, being the joint work of the Government and the railroad companies, it has happily resulted that the latter have in the main very generally adopted its formulas for their own use.

Exhibits particularizing the expenditures of railroads do not have the same value placed upon them on different roads. The nature of the business and the extent of the property have their influence. The character of those in charge, their experience, the measure of their industry, their length of service and familiarity with the property also have much to do with the value put upon statements exhibiting cost. Many railway managers of long service and great and acknowledged ability, recognized as preeminent in their profession, feel the pulse of the property in a more simple and practical way. Laying their plans broadly, they watch their execution with unceasing vigilance and know the results attained with measurable accuracy without the aid of the carefully tabulated sheets showing the units of cost that others esteem so necessary. They are on the ground, directing operations and, being familiar with the property, have personal knowledge of what is occurring. Such men, however, are uncommon. Few will assume such responsibility or have the experience, the executive talent, the death-like patience, the wisdom and the physical and mental strength, coupled with the necessary knowledge of the property, to fill so great a role.

Such is one type of management and represents the greatest concentration possible in rail-

way administration. Generally speaking, railway managers, if permitted the outlay—as they should be—insist upon full and scientifically constructed exhibits of cost to determine whether their efforts in conjunction with the work of subordinate officers and employes meets the full measure of service that they think intelligence, experience, skill and industry render possible. Such statistical information they esteem absolutely essential to enable them to measure the degree of success that attends their management. No two, however, it is probable, will agree as to the exact form exhibits of cost shall take. One will attach great importance to this thing, another to that, their training, the bent of their minds, the character of the property and the nature of the business, influencing them in their decision.

In the practical operation of railroads each subordinate operating official in his place is actively concerned with the particular things entrusted to his supervision. Those in charge of the track watch its great outlay unceasingly; know the cost of each item of material; of every implement; of every hour's work and what it was expended upon; the number of rails laid and the cost of labor laying them; the number of ties laid and the cost of laying; the time expended upon general repairs of track and the cost thereof; and the same in regard to ballasting, clearing ditches and road of weeds, brush, and other obstructions; the cost of freshet repairs, of work on bridges and culverts, of watchmen, flagmen, and so on. All this with reference also to the use made of the track and the durability, under

such use, of its constituent parts.* In addition to the information furnished in regard to track work, as indicated, those in charge also preserve careful records of track fixtures, particularly rails and the longevity of ties of different kinds, treated with preservatives and otherwise.

Like careful records are also kept of bridges, buildings and other structures, and the cost of each and the nature of work and expense each entails for renewals and otherwise. In fact, expenditures of every nature are traced and carefully itemized and a record preserved to prevent waste or misappropriation and for the valuable suggestions and experience their use affords. This can be done in a practical way and at little cost. The management desires to know the cost of repairs on a particular building or bridge, we will say. It is not necessary in order to furnish this that a book account should be opened with every such structure. The accountant, in charging items of expenditure of this nature under the general operating account of "Repairs of Buildings" or "Repairs of Bridges and Culverts," can note the structure for which the expense is incurred, so that the amount of outlay on any particular building or bridge may be ascertained at will, and the items and total furnished from the general records at headquarters.

The Superintendent of Motive Power, not less alert than those in charge of the track, scrutinizes unceasingly the consumption of fuel and oil

* The first material and labor records (to be written up by Section Foreman for the Management) classifying track supplies, tools and labor, and the cost thereof, were devised by the writer in 1866. Since that time he has improved these returns as experience suggested. While still imperfect, in many respects they are yet very serviceable for the light they throw on the vast expenditures account of track material, tools and labor.

per unit of service; also the life of every part of the locomotive, that he may determine whether it meets the full measure of expectation and the guarantees of manufacturers. He also knows exactly the service each locomotive has performed, the nature and cost of its repairs, and whether proportionate or otherwise.

The Superintendent of Cars in like manner supervises the vehicles under his charge, the service they perform and the durability of their standard parts. For this purpose, as in the case of the Superintendent of Motive Power, he is furnished daily (and supplementary to his personal watchfulness) with such returns from subordinates as are necessary to keep him practically advised of the conditions of the service over the whole extent of territory under his charge. The information thus collected, these officers submit to such tests, comparative and otherwise, as are necessary to determine whether the service performed by locomotives and cars has been up to the maximum standard of efficiency or otherwise.*

I refer in this place to these important branches of the service merely as illustrative of measures taken in every department to scrutinize and measure expenditures.

As the operating of railroads more nearly approaches a science the ingenuity of accounting officers is taxed to the utmost to respond to the inquiries of managers respecting various expenditures of a minor nature. Thus it is required

* The resourcefulness and ingenuity displayed by those in charge of equipment in supervising their work is illustrated and explained in detail in the books of this series that treat more particularly of locomotives and cars.

that aggregates classified under standard operating heads shall be subdivided in turn and the unit of cost measured by the service performed. With other improvements in railway administration, more efficacious means of determining the product of expenditures—what has been received therefor—are being introduced as a means of testing the measure of success achieved. Thus the unit of cost per ton hauled (i. e., effective service performed) was formerly little regarded in analyzing expenditures. Today, the main query is not as to the cost per train mile, the number of trains, the mileage made, or number of vehicles moved, but the net tons hauled per train mile and the unit of cost thereof. However, each of the exceptions just noted is made in its place a test of expenditures.

As already intimated, the measures taken to scrutinize expenditures vary on different roads accordingly as owners and managers esteem them important or otherwise. Therefore in specifying sources of information that may be useful in measuring results of operation by comparison (with other periods and properties) and in other ways, it will be understood that what I have to say is suggestive merely; in the case of one property it may be vitally important; in the case of another may have less value.

A simple but valuable means of testing current expenditures is to compare them with those of a corresponding period for the previous year; and, if conditions are the same, with the preceding month. In this way, by means of parallel columns, both periods are shown with the increases and decreases. These forms of comparison for

expenditures—and earnings as well—are generally used and precede all others. Thus, if there has been an increase during the month in the cost of track labor, we will say, it will stand out conspicuously and so the attention of the management will instantly be called to it. Similar comparisons are made of every operating and earnings account.

It is also esteemed important by some companies to show the earnings and expenses of each line and branch separately. Thus the earnings and expenses of the main-line will be shown apart; and so for each lateral line, feeder or branch. By thus subdividing a property, the net revenue producing qualities of its various units may be ascertained. In thus separating the gross earnings and expenses of a company only approximate results are, however, obtainable, for the reason that many general expenses must be apportioned to the various parts of the property on an arbitrary basis.* The results, thus attained, while not wholly satisfactory, are still thought to be valuable by some managers as aids in their efforts to restrict expenditures within limits justified by receipts. Efforts in this direction, however, can never be wholly successful, as many expenses are affected very little or not at all by the business done. Many managers do not esteem the information, afforded by a minute subdivision of expenses and earnings, as explained

* The cost of repairs of locomotives will, for instance, be apportioned to different divisions on the basis of locomotive mileage made on such divisions; and the same rule will be followed in regard to cost of repairs of passenger and freight cars. General expenses at headquarters and elsewhere, common to two or more divisions, will, similarly, be apportioned on such basis as is practicable and seems most equitable.

above, of enough value to warrant the cost of accounting they entail; and so will not go farther than exhibits of earnings and expenses of the grand divisions of a property. In other cases they may wish to know the earnings and expenses of main-lines and branches separately, bulking the latter and omitting any attempt to show the expense of each branch. Just where the attempt to show the earnings and expenses of particular parts of a road should begin and end managers differ; and so—like all other matters relating to railway operations—no fixed rule can be laid down that all will subscribe to as being necessary or desirable.

To further dissect and scrutinize operating expenses, some railroad companies strive to show the cost of handling the passenger and freight business separately. This is more difficult however than the apportionment of expenses to divisions, already described. For the reason that speed is an element of cost, the exact relation of which to maintenance, it is impossible to determine. It has been claimed by those authorized to speak on such matters that wear and tear of track and equipment increases with the square of the velocity. It is probable, however, that on a perfectly ballasted road-bed—if there be such—with heavy rails, that this proportion would be too great; but to what extent speed is a factor under the circumstances last named, there is nothing at hand to determine. Speed affects both road-way and equipment and, therefore, may be said to affect fully forty per cent of the gross operating expenses of railroads. In regard to operating expenses that relate specifically to pas-

senger or freight, they may be charged directly to the class of traffic affected. For what remains, namely, expenses of a general nature, it is impossible, from any knowledge we possess, to devise a satisfactory basis that will take due account of the element of speed as regards cost; certainly a large arbitrary must be added to the gross tonnage or mileage of passenger trains.* Because of the insuperable difficulties referred to, no attempt has been made generally, by railroads, to effect a separation of expenses as between the two great classes of traffic, and the Interstate Commerce Commission, likewise recognizing the situation, some years ago withdrew this provision from the annual report it requires from railroad companies. This was but just, for the reason that at that time, and now, no such division could be made by railroads that would not, because of its unreliability, be likely to be used unjustly to their detriment. It has been suggested, however, that for an isolated piece of road the expenses incident thereto might possibly be segregated on some kind of approximate basis as between freight and passenger business. However this may be, it would involve long and minute research and great expense for clerical labor; so great indeed that it would be foolish extravagance to attempt it in the case of a railway system as a whole—remembering how little value the result would have when attained. However, if it were possible to ascertain the cost of operating passenger trains apart from freight, we should still have to separate from the former the cost of the

* In another volume will be found a chapter explaining some of the difficulties to be met with in an attempt to show the expense of passenger and freight business separately. The subject is too extended and complex to be summarized here.

Express (parcel) and Mail traffic, both of which form an integral part of the passenger service and yet are handled in differently constructed and operated cars, the expense attending which and the revenue derived therefrom, forming no part of the passenger expenses and earnings. Thus it will be seen that the obstacles that prevent a separation of the expenses of passenger and freight service are further aggravated by the difficulty of ascertaining the cost of passenger traffic per se apart from its concomitants.

It thus being true, because of the crisscrossing and intermingling of passenger, freight and other traffic expenses that we cannot determine the exact cost of either separately we, perforce, must content ourselves with knowing the outlay involved for each dollar of gross revenue a company earns, i. e., the percentage that operating expenses bear to the total earnings. And this every American company shows, in connection with its classified statement of operating expenses; first, the percentage that the latter bears to gross earnings, excluding taxes, and second, including the same. And in connection with this showing, the measure of confidence it merits, will depend, it is manifest, upon whether all expenses are included that properly belong within the period, and also whether the property has been fully maintained during the time covered by the exhibit, as any omission or neglect, it is apparent, will have the effect to lessen the operating expenses (for the time specified) and increase net earnings by the same amount. It is reasonable to suppose, however, for it is true as a matter of fact, that substantially all charges

are included and that every plant is kept up to the general requirements of business; and this last because it is so manifestly to the interest of every company that its property should not be allowed to deteriorate because of the great waste and improvident burden such a course afterwards entails.

While we cannot, therefore, for reasons explained here and elsewhere, ascertain the percentage of cost for handling various forms of traffic separately, except in a very limited way, we may ascertain the ratio of cost to the whole for the five great divisions of expense, namely: maintenance of way and structures; maintenance of equipment; conducting transportation; traffic expenses, and general expenses. The percentage these separately bear to earnings and to each other we may ascertain, and thus, in a measure, determine the percentage of outlays for these great departments. But this information, while it may be of value for comparing different periods for the same property, has little value for general purposes because of the diversity that exists among railroads in cost of maintenance and expense of handling traffic.

Considerable curiosity and importance is attached to the ascertainment and application of units of cost to maintenance and other operating expenses. It has ever been a practice with manufacturers to know the cost of things and its relation to current prices. And the practice should be applied equally to the manufacture of railroad transportation so far as practicable; and this with a view to determining the value of methods of administration and also the relation of earnings to outlay in

particular instances. Thus suspected losses could be fully known and the measure of economy exercised in the conduct of business more accurately determined. Unfortunately the nature of the outlays and the wide extent of territory to be watched and the diversity and unalterable circumstances attending the operation of different sections of the same property, preclude this except within very narrow limits. The question occurs then what units of cost are applicable to the general operations of a railroad as a whole and have they any specific value when determined, commensurate with the cost involved in their procurement? The answer to these inquiries is, in both cases, unsatisfactory, the relation of gross expenses to receipts being the only basis generally applicable, the accuracy of which, however restricted its value, cannot be questioned.

The measure of responsibility that divisional and other officers can be held responsible for, must be measured by the nature of their duties and the expense of operation they actually control. Thus a division or general superintendent cannot be held for the things he knows nothing about, such as the law department, taxes, general office expenses, and so on. Such expenses must therefore be eliminated from tables of outlay designed to show or measure his responsibility. And so in regard to the general counsel, traffic manager, accountant, land commissioner, and others. Each must be measured by the things for which he, as an official, is accountable. And in comparing the expenditures of departments, one with the other, or one period with

another, every item of expense not applicable, together with all the peculiar circumstances attending the working of the department, must be carefully considered. Thus, to illustrate, the freight earnings of two different companies may be the same and yet the expense attending the auditing of the accounts of one may be ten times as great as the other, the difference arising from the greater number of way-bills handled. Differences of this character arise in connection with every branch of the service and, in order to properly measure the responsibility of those concerned, must be remembered and duly considered.

In so far as current expenditures are measured by those of another period, and indeed in all cases, it is important that the information should be furnished the management at as early a moment as possible. A comparative statement of the operating expenses should be forthcoming as early as the twenty-second of the succeeding month and sooner if possible. The comparison thus shown with the corresponding period of the previous year or month enlightens and refreshes the minds of the management if any outlay not justified by current needs, has escaped its attention. The value of early information regarding expenditures cannot be over-estimated. It means, oftentimes, reductions coincident with the furnishing of the information; and so every hour's delay may involve a loss, great or small. In other ways such information is of course valuable as a means of testing success or failure in matters of general management.

Exhibits of earnings and expenses for a particular period should of course include everything properly coming within such period. In the case of expenditures it will not be the cash paid out nor the material bought, but the actual disbursements in operation. If the material bought is used it should be included; if only a part has been used the balance should remain on the books as an asset, until disbursed. It is unavoidable that such items as claims for losses, damages and injuries should not all be known and shown when the books for the current month or year are closed. This is to be regretted, but such items are comparatively unimportant and, in the main, the accounts carried over will be offset by those of the corresponding period and so comparisons will be substantially accurate. It will also be valuable in some cases in order to thoroughly analyze disbursement accounts, to give variable and fixed expenses separately, so far as they are respectively dependent upon the volume of business. In this way any expense incurred for some particular reason will be discovered if, through oversight, it is allowed to continue after the reason therefor has ceased to exist.

It is said that everything is good or bad, by comparison. Certain it is that the operating exhibits prepared for the management of railroads will be greatly enhanced in value by being made comparative, showing increases and decreases in every instance. For these are the two great stellar-lights that ever interest and guide a management, flaring out blood-red if anything is wrong, and white if everything is normal. The

general balance sheet of a company should, for local use, similarly be comparative, showing the increases and decreases in each general account of the company (both debit and credit) so that their state, relatively, may be seen at a glance.

The mile unit, so called, affords valuable information and a practical means of determining units of service and units of cost within certain limits; and while every one does not attach the same value to the information thus afforded there can be no doubt of its great importance as a guide in many instances. Thus it is used in designating the total distance passengers and freight tons are carried, respectively; also the total mileage of empty and loaded cars, engines, trains, wheels, etc., separately, as particularized further on. The mileage is determined in the following manner. The passenger mileage, to use it as an illustration, is arrived at by multiplying the number of passengers carried by the distance they travel respectively, the result being the number of passengers carried one mile, of which the unit is the passenger mile—the movement of one passenger one mile. The freight ton mileage and car, engine, train, wheel, and tire mileage are arrived at in a like manner. By dividing the gross freight earnings (to illustrate a use that is made of the mile unit) by the total number of tons carried one mile, the average rate earned for each ton per mile is arrived at. By comparing this with the preceding year or month, the increase or decrease in the average rate is shown. In the case of expenditures, by dividing, we will say, the total number of pints of oil used

in lubricating freight cars by the total wheel mileage of such cars, the average consumption per wheel mile is attained. The value of information of this character is of vast importance in itself but is greatly enhanced by comparisons with corresponding periods or with similar expenditures on other roads.

The mile units, arrived at in the manner described and representing different phases of operations, may be recapitulated as follows:

The passenger mile unit represents the movement of one passenger one mile. The mileage of each class may also be thus shown.

The freight ton mile unit represents the movement of one ton of freight one mile. The mileage of each class or commodity might be approximately shown, if the great cost permitted.

The wheel mile represents the movement of one wheel one mile. This mileage is arrived at by multiplying the mileage of cars and locomotives, respectively, by the total number of wheels thereunder. In the case of cars the mileage is shown separately for passenger, freight, baggage, mail, etc. The different kinds of wheels under locomotives (driver, truck and tender) are also shown separately so that the longevity of each, including tires, may be determined.

The engine mile represents the movement of one locomotive and tender one mile.

The car mile represents the movement of one car (the different classes being given separately) one mile, loaded and empty cars being given apart.

The train mile represents the movement of one train (classified) one mile.

The net train ton mile represents the movement of one ton one mile, based on the total weight of cars hauled and their contents.

The gross train ton mile represents the movement of one ton one mile, based on the total weight of cars and contents, including the locomotive and tender.*

The value of the mile unit for testing expenses has many limitations. Thus it takes no account of the factors of speed, grades, alignments, terminal appurtenances, weather conditions, traffic density, nor, as usually applied, of the different classes of traffic such as first, second and third class passengers, and the bulk and nature of commodities carried. It is, however, extremely valuable in many ways, and some of its useful purposes are pointed out below. It also answers many necessary and useful purposes in apportioning operating expenses to the different divisions of a road and in exhibits intended to show, however futile and valueless, the cost of passenger and freight service separately.

The Passenger Mile. As mail and express matter is carried on the same trains with passengers, it is difficult, if not impossible, to separate the cost of carrying passengers from that of carrying the mails and express. A portion of

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* The foregoing units of measurement are designated "compound units," in contradistinction to "simple units," such as:
Unit of Mass—The Ton (2,000 pounds).
Unit of Distance—The Mile (5,280 feet).
Unit of Time—The Hour (60 minutes).
Unit of Motive Power—The Engine (an engine or motor of any type).
Unit of Rolling Stock—The Car (a car of any type used in train service).
Unit of Road Movement—The Train (as defined by the Standard Code).

the expenses of passenger trains, it is also apparent, are not dependent, for the moment, on the number of passengers carried. Station and other facilities are provided, and the train must run as scheduled, and make the various stops irrespective of the number of passengers carried. For these and other reasons the passenger mile is limited as a means of testing passenger expenses. It is esteemed useful, however, in some instances, more particularly in connection with certain passenger traffic expenses of a company. In connection, in fact, with any expense directly or remotely dependent upon the gross mileage of passengers. Its great use, however, is in determining the average rate of fare, a thing of active interest (as a test for purposes of comparison and otherwise) to every management. It is the custom on some roads to keep the earnings of each passenger train separately so that its earnings may be compared with the cost of operating; this, and also for the purpose of auditing ticket sales and fares collected. The gross mileage of passengers and the average rate per passenger per mile may be shown for each train, if thought desirable. This used in connection with the number of passengers carried and the mileage of the train, will afford a very minute analysis of the business. The advantage gained, however, is not apparent, measured by the cost of the clerical work. The information would show the service performed and so be a useful hint in determining the reasonableness of the expense incurred.

The Freight Ton Mile. The freight ton mile is esteemed useful by some in measuring the gen-

eral expenses connected with the freight business. It is also sometimes used (though its appropriateness is doubtful) to measure the cost of repairs of freight cars and in connection with the locomotive and train service; but it is not as adaptable for these purposes as the car or engine mile, or net train ton mile units. Like the passenger mile, it has a value in determining the average freight rate for the time being, information thought to be indispensable in this country. In respect to this it is of much greater practical value than in the case of passengers, for the reason that the rates for the latter are comparatively stable, while freight rates fluctuate constantly and widely to meet the exactions of competitive carriers and markets.

Another important use made of the freight ton mile is that of ascertaining the density of traffic; the average number of tons carried one mile per mile of road; the average number of tons carried per train; and, still more important, the average number of tons carried per loaded car. While there can be no uniformity in this respect as between different roads or different divisions of the same road, the average load per car hauled will always be interesting and valuable to a management in its efforts to discover to what extent its utilities are used by those who have immediate charge of the physical handling of traffic.

Referring to the lack of uniformity on different railroads in regard to the average ton haul per loaded freight car, the writer has this to say on the subject in another volume: "There are few situations, few localities so isolated that shippers are compelled to submit patiently to

delays in supplying their wants. In remote parts of the world there may be, indeed there are, localities where the carrier may, with perfect reasonableness, decline to send a car forward until there is a full load, whether it be hours or days in filling. In such cases there is the maximum profit to the carrier. Shippers understand the situation and their business is built up to conform thereto. They acquiesce perforce in the rule that the cars must be filled, and afterwards will not be hauled until there are also full train-loads. Thus the maximum train mile tonnage is assured the carrier to the great gratification of owner and manager, and the no less shame and mortification of managers of other roads where traffic must meet the instant wants of the patrons or be lost; but where, alas, the result of such futile operations will, nevertheless, be compared with the more favored company—and very likely criticised unjustly because of the relatively poor showing."

The Wheel Mile. The wheel mile may be used to analyze consumption (and cost) of oil, waste, tallow, etc., for lubricating locomotives and cars. However, in the case of locomotives the locomotive mile and the net train ton mile units are also used as bases. In the case of cars the car mile is also used. Consumption per wheel per mile run for lubricants is determined, as already explained, by dividing the quantity of oil, waste and tallow for each purpose by the locomotive and car wheelage respectively; the wheel miles run per pint of oil or pound of waste being determined by dividing the total wheel mileage

by the pints of oil or pounds of waste used respectively.*

Wheels are oftentimes guaranteed by the manufacturers to render certain service. The form of guarantee is not uniform, however. Thus in one case it will be based on mileage, and in another on time. Where the guarantee is based on mileage, the wheel mile record is necessary to determine whether or not such guarantees are fulfilled. Such a record is also of value in determining the relative wearing qualities of steel tires for locomotive and passenger car wheels.

The wheel mile as a unit of comparison is inapplicable in those cases where it is necessary to differentiate between loaded and empty cars or between, say, an engine that weighs fifty tons and another that weighs one hundred and fifty tons. Divergent views are held as to its value as a unit of measurement for dividing maintenance of way and other accounts between two companies operating a track in common. The gross train ton mile would seem to be a better basis of division in such case as representing work done and therefore a more accurate guide of wear and tear to track.

The Engine Mile. The engine mile is esteemed serviceable for measuring the cost of locomotive work, viz.: cost per mile run for general renewals; ordinary repairs, and current supplies; also for testing the expense for enginemen and roundhouse men and the consumption of fuel, oil, waste

* To effect this computation the mileage of cars with eight wheels is computed separately from the mileage of cars with twelve wheels, and so on.

and tallow on locomotives, namely: tons of coal and quantities of oil, waste and tallow per mile. Information of this character is interesting in itself, but is especially valuable for the purpose of comparing the results for each engine with that of other engines of like class and service. The engine mile unit, while used for many purposes, is however of less value generally speaking than the net train ton mile.

In order that cost may be shown for each kind of locomotive, engine mileage should be classified as follows:

Passenger engine mileage,
Freight engine mileage,
Mixed train engine mileage,
Helping engine mileage,
Light engine mileage,
Switching engine mileage,
Work engine mileage.

The Car Mile. The car mile is made use of in testing the average cost per car (and for cars in the aggregate) for repairs per mile run. It is also used in some cases for analyzing the cost of train supplies and expenses; also in determining the average load per car, presuming that the mileage of empty cars is kept apart from that of loaded cars. In this connection two empty cars are sometimes computed as being equal to one loaded car, for the purpose of measuring the cost of locomotive and train service per loaded car mile. The car mile unit is valuable as a guide in determining the economical use, or otherwise, of oil and waste; also for the

purpose of ascertaining whether the oil used fulfills the terms of the merchants' guarantee, when the latter covers specific distances. It is also used in determining the wearing qualities (and therefore the relative cost and value) of brake shoes, journal bearings, wheels, axles, etc.

In order to ascertain whether cars afford proportionate returns, the cost of repairs per mile run should be computed on the basis of tonnage capacity.* The car mile is further used to determine the number of passengers or tons of revenue freight per car per mile run; this is effected by dividing the total number of passengers or tons carried one mile by the total mileage of loaded (revenue) cars. While it would seem that the wear and tear of loaded cars must be greater than that of empty cars, yet it is claimed by experts in such matters that the difference is not appreciable. Theories in regard to this, however, may be tested (if the information were worth the clerical labor it would cost), by taking several cars and ascertaining the average cost for repairs per mile run, for each car separately. Then having ascertained the mileage of each car separately, both loaded and empty, and the proportion that each bears to the total, we would have the data for making the comparisons desired. To render such statistics accurate, however, it is essential that the cars should be of similar construction, of the same age, in like

* In analyzing the cost of repairs per car mile it would be desirable (if the expense of the accounting connected therewith were not too great) to differentiate between the various types of cars, i. e., to keep the cost of each type separate. This would require that the mileage should also be kept separate.

condition, and during the test be exposed to substantially like conditions.*

The Train Mile. The train mile is the unit of movement between terminals. It is used more or less (whether appropriately or not) in testing expenses such as telegraph, personal injuries, clearing wrecks, etc. As trains vary greatly, it is not a fit unit for measuring expenses dependent upon the number of cars or weight of trains, such as car repairs or tons of fuel consumed by locomotives. The train mile is useful in determining the average number of cars per train per mile run; also in determining the average tons of freight or number of passengers carried respectively, per train per mile run. To further particularize, the train mile unit is esteemed especially adaptable for making comparative tests of train expenses, such as conductors, brakemen, baggagemen, collectors and train porters. It is, however, not an equitable basis to be used generally. Thus, in the case of a train hauled by a single engine as against another containing a greater number of cars and drawn by two locomotives, but classed as one train. It is also apparent that it would not be fair to compare the last named with that of two trains hauling, practically, a like number of cars. By the use of the double header the wages of a conductor, and perhaps a brakeman, is saved while the mileage of the two trains is, of course, double that of the other. Moreover, the risk of collisions and

* Per contra and in invalidation of this method of determining relative cost, it is claimed by those familiar with such matters that fully sixty-five per cent. of the damage occasioned freight cars is in the switching yards, and only thirty-five per cent. in road service.

accidents of a similar nature is diminished in the case of the single train. This is offset somewhat by the risk of the train breaking in two and thereby causing damage because of the great number of cars and the strain put upon the couplers in the case of the double header. The cost of operating a double header is also greater (irrespective of engine expenses and service) than one hauled by a single locomotive, though it would be difficult perhaps to accurately particularize such excess.

The Net Train Ton Mile. This is arrived at by taking the weight of each train and contents (exclusive of locomotive and tender) and multiplying it by the mileage of the train. The proportion that the dead weight bears to the total weight in the case of freight, is obtained by dividing the total freight ton miles by the total net train ton miles. In the case of passenger service, an arbitrary tonnage is added usually, to cover the weight of passengers, baggage, mail etc.*

The net train ton mile is thought to be peculiarly adapted for testing the work done and the relative cost of locomotive service. The cost per net train ton mile, in this connection, is analyzed in a manner generally similar to that described in connection with the engine mile.

The net train ton mile is an admirable basis for testing the measure of cost for various items

* There is no uniformity of practice, it appears, in regard to estimated weight for passengers that should be added to the weight of the car. This is also true in the case of contents of baggage and mail cars. In some instances three tons are added to each car for passengers, baggage and mail; in other cases two tons per passenger car and five tons for baggage and mail cars.

chargeable to locomotives, such as repairs, fuel, oil, waste and tallow, engineers, firemen, wipers, dispatchers, roundhouse laborers, tools and other supplies. It represents more accurately the work performed by locomotives than the engine or train mile basis and is therefore better for comparative and other purposes.

The net train ton mile is an adaptable measure of service for the reason that it is a constant unit. Under the engine or train mile basis the lighter the train handled the better the comparative showing; under the train ton mile basis the heaviest train should, relatively, make the best showing. Under the net train ton mile basis operations are subjected to an economic measurement impossible under the engine or train mile basis. The net train ton mile being based on the unit of work done is an accurate measure of service rendered, while the other is not. To illustrate: we will suppose the average monthly mileage in one year per engine is 3169 miles; for the succeeding year the average is 3264 miles, showing an increase of three per cent. On the other hand the average monthly net train ton mileage per engine, we will say, is 867,210 tons; and for the succeeding year, 1,075,340 tons, or an increase of twenty-four per cent. On the engine mile basis the locomotive performed, it would appear, practically the same work each year, while on the net train ton mile basis it shows an increase of twenty-four per cent. This favorable showing, it will be found, resulted from the use of more powerful locomotives, an increased tonnage rating of locomotives or, more probably, a combination of both.

A comparison of fuel consumption on the engine mile and net train ton mile bases is equally instructive. Thus, for engines having a tonnage rating of fifteen hundred tons between two points one hundred and fifty miles apart, one engine will make the run pulling nine hundred tons, while the other will haul fifteen hundred tons; on the net train ton mile basis one can see at a glance the difference in service rendered, while it would not be perceptible in the other case.

Measuring locomotive expenses on the net train ton mile basis is ever an incentive to those in charge to see that engines haul the maximum tonnage based on their rating, respectively, which last (i. e., their hauling capacity) is ascertained by the use of the dynamometer car. The cost of operation per mile run will presumably show an increase when the maximum tonnage is hauled, for the reason that the locomotive will deteriorate more rapidly because of the increased burden put upon it. Finally, it may be said, that the definite information conveyed by the net train ton mile basis enables the management to measure, accurately, each unit of work done for each unit of cost; hence its usefulness and value.

A writer on this subject says: "In order to determine the relative economy exercised in the use of locomotives, the gross tonnage hauled should be tested by the units of power capable of being developed by the locomotives. If the number of net train ton miles per locomotive tractive power mile can be increased, the efficiency of the locomotive service is correspondingly augmented, provided the cost of mainte-

nance and operation are not increased proportionately. This latter factor can be determined by applying the proper test, viz: the cost per unit of work done—the net train ton mile."

With the information in hand furnished by the net train ton mile, showing the average number of tons hauled per train for a particular line, and having also at hand the average tractive power of the locomotives on that particular line, when practicable, those interested in the matter may readily discover whether the power has been used to the full extent or how much it has fallen short.

The Gross Train Ton Mile. The gross train ton mile includes the weight of the engine and tender and is recommended by some as the only basis of computation by the Motive Power Department. It would seem, however, that it would be just as appropriate for the miller to add his own weight to his grist, as for the power department to add the weight of the locomotive to the product of its work.* The cost of the gross train ton mile is a proper basis for ascertaining the cost per ton and per passenger moved. It is especially adaptable as a basis for dividing track and similar expenses between companies operating tracks in common and sharing the expense according to the use made thereof. It is probable that while wheelage is more often used for this purpose, there can be no doubt that the

* This is claimed, however, to be an extreme view of the case, for the reason that five pounds' pull on the draw-bar will move one ton of freight in a car behind the draw-bar, while it will take, it is claimed, equal to twelve pounds' pull on the draw-bar to move a ton of the engine itself. In other words, it costs more than twice as much to move one ton of weight in the engine as it does in the car.

gross train ton mile is a more fit basis of apportionment, representing, as it does, actual use of facilities and therefore a more trustworthy indication of the wear and tear of track and appurtenances. In other respects it is also apparent, leaving out the question of speed, that the gross train ton mile represents wear and tear of rails and other fixtures of track more nearly than any other unit of measurement. The gross train ton mile also affords a more equitable basis for apportioning many general expenses between the different divisions of a road than earnings or mileage of track. And this is true also, in a measure, in regard to certain expenses that are common to both passenger and freight traffic.

The foregoing minute enumeration of methods, while voluminous, forms only a part—the technical part—of the measures adopted by railroad companies to safeguard their expenses; to secure efficiency and prevent extravagance or waste. Those enforced in connection with labor are a case in point. This is also true of material, including fuel. Thus the ordering, purchasing, caring for, disbursing, using and accounting for material is of unexampled importance in the economy of railway operations and is safeguarded by measures corresponding thereto. "It is not what you earn but what you save," is an old proverb, and as true of corporations as of individuals. For how unavailing all the thought expended upon the track, in arranging trains, in economizing power, in securing traffic, if wisdom and efficiency are not exercised

in buying, husbanding and expending material which forms so enormous a proportion of the total expenditures of a railway. In no other field of enterprise is there so great a variety of different kinds of material used, and in such vast quantities, with such inadequate facilities for guarding. Every species of industry is drawn upon to supply the need. How to safeguard this vast expenditure in money is one of the questions confronting every railway manager. And in this connection, it must not be overlooked that methods of accounting must be adequate to the need, otherwise the enforcement of honesty, wisdom and frugality can not be fully assured and the high attainment sought by a management will be frittered away to that extent. And while the field is vast and involves innumerable subtleties, yet all the agencies and methods employed must harmonize; must work without friction, whether the purpose be that of a check or merely co-operative effort. How to accomplish this and other problems relating to material and labor and the miscellaneous expenditures of a railroad company, form the subject of the succeeding chapters of this book. The matter is discussed briefly in its economic aspects, but more fully in regard to classification of expenditures and the concrete rules and regulations that must, in one shape or another, be enforced on every railroad to secure effective service.

CHAPTER II.

RAILWAY SUPPLIES: NECESSITY AND VALUE OF HANDLING THEM SCIENTIFICALLY.

The supplies of a railroad are understood to mean new and old material on hand in store, not in use. Incidentally, however, they include property of a portable nature, such as tools in the hands of workmen, the due protection of which is important, as supplies in store must be drawn upon to replace them. I shall, therefore, not only consider the question of supplies, but point out some necessary safeguards in connection with their use.

The supplies of a railway constitute personal property. They are in the nature of a permanent investment. They have a current value in the market, yet are not available as an asset (except in the sense that the right of way of a railroad is an asset), for the reason that a property cannot be operated without them, any more than it can be operated without a track. They are, therefore, to be viewed from the same standpoint as the latter. They cannot be disposed of, and can only be slightly diminished in amount.

The custom in regard to the disposition of supplies in the accounts is not uniform. Thus, it was not the practice, in former times, in America, to capitalize these investments. The reason of this omission doubtless grew out of the fact that the amount in the early history of railroads was small, and the credit of the companies so pinched as not to make it easy to capitalize expenditures of this nature.

The amount of material necessary for a company to keep on hand to meet current wants depends largely on the proximity of markets and the character and extent of the property and the amount of its business.

The value of railway supplies on hand, with the tools and light implements in the hands of employes, are thought to represent an average of about two and one-half per cent. of the total amount invested in railway property.

Each year adds to the number of articles that a railway uses. Improvements, new conveniences and luxuries swell the list. Upon many roads, libraries, baths, barber shops, pianos, card tables, luxurious lounges, secretaries, etc., form

part of the paraphernalia of trains. The list will go on increasing until it embraces every article found in the most luxurious home.

Not only are the articles used by railroads multiplying from day to day, but they are also improving in quality. A car wheel that would average twenty thousand miles was formerly thought to be of high grade. Now wheels average much higher, notwithstanding the increased speed of trains and weight of cars.

Supplies represent cash. It takes cash to replace them. They should, therefore, be guarded with the same care as cash. This is not usual. The reason is that the use rather than the value of the thing is considered. If we lose a package of money, the fact is bemoaned by a whole continent; the Associated Press recognizes its importance; the telegraph resounds with its details; local reporters exert themselves to ascertain particulars. If the employe of a corporation loses it, he is blamed, perhaps disgraced. If money is stolen, myriads of detectives prick up their ears in anticipation of the reward. When the agent of a railroad embezzles a few dollars, the staff trembles with suppressed indignation and no stone is left unturned to secure a return of the money and the punishment of the delinquent. This is the rule with cash; it is not the rule with supplies. The loss or improvident use of material is not known in the majority of cases, even by those immediately in charge. Why? Because of defective methods of handling material.

The amount of material at any designated point on a road is an unknown quantity. Absolute precision, as in the case of cash, is impossible. If there is a surplus or deficiency when the inventory is taken, it is adjusted in the accounts without remark, unless excessive or peculiar. Arbitrary regulations that govern in the case of cash cannot apply to material. Those in charge of material are quite as honest as those who handle cash, but they do not have the same check upon it; cannot guard it with equal care. This breeds improvidence, carelessness of thought and action, and while any known offense is punished, discovery is not sure, as it is in the case of loss of money. This is demoralizing; it makes men forget that material has the same value to a company as cash, and that its destruction or improper use is equally disastrous.

In order to insure necessary and proper safeguards in the handling of material, we must consider it from the standpoint of value solely. To misappropriate or waste it must be esteemed the same as the misappropriation or loss of money. Its deterioration through lack of proper care must be looked upon the same as any other offense against good business

usage. Its loss must be thought the same as the loss of money. It is no exaggeration to say that a cashier who would use a drawer that contained cracks through which more or less money was lost, or who stored his cash on window sills and in public entries, would be considered improvident in his methods of business. The losses that occur in connection with material that are avoidable, within just and reasonable limits, are as inexcusable as the loss of money under the circumstances named.

The disparity that exists between the care of property and the care of money is ludicrous, not only upon railroads but elsewhere. We watch our money with unceasing vigilance; when we receive it we count and recount it, examining it meanwhile with eye and tooth. While it is in our possession we store it in costly vaults and in safes at once the pride of artisans and the despair of burglars. When we pay it out we count and recount it as before, and at the close of each day particularize our payments and sum up that which we have on hand with the utmost precision, lest a penny should be lost. This care is not exaggerated. It is the result of experience, of necessary precaution. What are the practices of railroads in regard to material? Is the same provision made for it that the merchant and manufacturer practice? Hardly! The purchaser inspects it when it is received, but in consequence of lack of experience and proper facilities, many counterfeits are palmed off upon him. When received, he does not place it in costly vaults or safes, nor even behind oaken doors or carefully barred windows. The smaller articles he places in what he calls a storeroom. This storeroom is, however, in many cases, nothing more nor less than a few shelves loosely constructed in a roundhouse, or a corner partitioned off, perhaps without locks or bolts. If the supply of material is large, a special room is assigned. But this room, in the majority of cases, is much too small, and its internal arrangements ill adapted to the purpose it serves. Whatever its character, it is used only to store small supplies. The great bulk of the material lies scattered about the buildings and yards. Some of it is waiting to be used on the morrow; some of it has been overlooked. It is scattered, because there is no convenient place for it. It is suffering more or less deterioration; many articles are lost or stolen, while such materials as oils impregnate the earth with their drippings and perfume the air with their odors. The picture is not exaggerated. There are, of course, exceptions. I have in mind storehouses constructed recently in the light of experience and known wants that are in every way adequate. These are the exceptions, however.

The blame does not attach to the railroad managers of

to-day. It antedates our time. Innumerable causes, however, tend to perpetuate it.

The scant thought given to the subject originally by those who planned our shops and depots of supply strikes the observer with amazement. If, when we paid money into a bank, it were necessary for the teller to crawl over a contiguous counter, through an open window, past a long line of men engaged in various occupations, in order to reach his money drawer, located in a coal cellar, we should say that the bank was poorly planned, if economy in its working and safety in the care of its funds were desirable. Yet the practices in regard to the handling and storage of material, in many instances, are quite as absurd. And what is more remarkable, is that they excite neither surprise nor suggestion.

It is probable that the defective system of railroads for handling material grew, primarily, out of a division of responsibility. It sprung up, like "Topsy," without method or forethought. Where shops were planned by an engineer, he was not called upon to make provision for supplies, or, if he was, the storehouse was inconveniently located. The rule was to construct such buildings out of remnants; not with reference to convenience of unloading, storing and disbursing, but with a view rather to the utilization of an unoccupied spot.

While elaborate provision has been made by railroads for their equipment and machinery, the storeroom for supplies has been forgotten or ignored. Nothing could exceed the convenient character of our machine shops and roundhouses, or the minute care that has been exercised to see that all the parts conform to the use to be made of them. Every device by which economy of labor and the protection of the plant can be secured is carefully considered. The same standard of excellence should be observed in regard to the supply stores. The standard should be the standard of private practice.

It does not require any extended or technical knowledge of railway affairs to teach us that the same care should be observed to protect railway supplies that a prudent and thrifty merchant uses to protect similar merchandise. To the extent this is neglected, we are remiss. The occasion of this remissness may excuse it, but it does not alter the conditions. To say that it is the result of lack of forethought and not of design, of inexperience and not of deliberate intention, does not make the loss any less to railroad companies. We must not expect, however, the high standard of the merchant. In his own business he is personally on the ground to plan, arrange and inspect; moreover, his intelli-

gence is heightened by the instinct of gain, of ownership; an hereditary instinct, the instinct that one merchant hands down to another. Those who operate railroads have not the habits of merchants, nor their personal incentive. This does not imply that they knowingly or wilfully omit any precaution or violate any law of ethics. The standard of morality among them is, probably, quite as high as it is among merchants. It is less effective in its methods, that is all. It approaches the perfection of the merchant only so far as it is supervised by men possessing equal intelligence and interest with the merchant, namely, the owner of the property.

Great progress has been made in handling material. Particular companies have given the matter thought and expression; they are exceptions, however. Proper provision is, in many cases, impossible at the present time. The room is lacking and the arrangement of shop buildings prevents. Originally the cost of storehouses led many companies to get along without them. That such economy was not justified, no one familiar with the subject need be told. In the inception of railroads in America the poverty that enveloped them knew neither time nor utility; it sacrificed, in its improvidence, both the present and the future. That the saving on the outlay would have abundantly justified the construction of adequate and properly located storehouses, we now know. But criticism cannot remedy the evil. It may, however, prevent similar neglect hereafter. Intelligent study of the subject may do much to ameliorate the situation.

Not the least of the evils that a company suffers from improper methods of storing material is the demoralization it engenders. It does not seem wrong to appropriate what is esteemed so lightly; to improvidently use what apparently has so little value. Thus losses multiply. Moreover, imperfect knowledge of supplies on hand engenders excessive orders. It is impossible to properly inspect or classify material or watch its disbursement with the care that should be exercised, when the facilities are inadequate.

No company can be so poor as to justify neglect to make proper provision for handling its supplies; to protect them from the elements; to throw around them such safeguards as are necessary to prevent their loss or improvident use. For articles that have a current value, such as copper, brass and tools, secure storehouses should be provided. For oils and kindred substances, capacious tanks should be built, in which they should be stored, and from which they may be drawn without waste or labor, as needed. For bulky articles that cannot be carried away surreptitiously, simple sheds are all that is needed. For old material, room is needed, first, for assorting and afterward for protection. Provision

for storing should, in fact, be such as a merchant provides under like conditions. The value is the same; the risk that attends neglect the same; the cost of replacement the same. This is not only true in regard to supplies about the shops and roundhouses, but it is also true in regard to the material scattered along the road, whether new or old. Every section of a line should not only have a place in which to store tools, but a secure place in which to store supplies and worn-out material. It is necessary to prevent loss and depreciation; it is also necessary to enable the foreman to render an intelligent account of the supplies and implements on hand.

The economical use of material is of the greatest importance to a company. To secure it every department of the service should be carefully watched; every device adopted; every expenditure guarded. Valuable material should not be used when inferior grades will answer; good timber should not be used when poor timber will do; in making requisitions for timber the right sizes should be ordered, and in cutting, waste should be avoided; lumber should be covered and so piled as to leave free circulation of air; timber taken from worn-out bridges and other structures should, when practicable, be utilized for heating stationary engines, kindling engine fires, blocking, etc. High-priced lubricants should not be used when cheap grades will answer; no more oil should be put into the boxes than is necessary; oil cups should be set so as to feed only the amount required to keep the parts lubricated; oil droppings from turning and other machines should not be thrown away, but drained and used again; waste for wiping should be used until its absorbing power is gone, after which it should be used for firing up, cleaning the dirt from wheels, machinery, etc.; waste taken from truck boxes (when trucks are repaired) should not be thrown away, but used to pack other boxes; fires should not be started with lubricating or illuminating oils; trackmen should see that tools, bolts, spikes and other material are not covered up or lost; blacksmiths should exercise economy in the use of fuel, should see that it is not consumed unnecessarily or thrown away when cleaning their forges; coal should not be lost by overloading locomotive tenders; iron and steel should not be exposed to the weather; finished iron should be protected by paint. These are only hints. The subject is interminable. Every device must, in fact, be exercised in the use and care of material that prudence and wise economy suggest.

The supplies used in the operation and maintenance of a railway constitute in the neighborhood of one-half of the operating expenses. This fact emphasizes the importance of rules and regulations governing them that shall be such as

to secure the best results. The subject is too great to be more than summarized. The investigations I have made are such as to show that not enough attention has been given the subject; that the waste in this branch of the service is great when due care is not exercised.*

The handling of railway supplies naturally brings up the question of buying cheaply. This involves, incidentally, markets, the ability of the purchasing agent, payment, quantity, place of delivery and innumerable other questions. It also involves the due and proper inspection of material; its care and disbursement, and finally the regard that is paid to it after it has been removed from the storehouse. It also involves the question of distribution of authority; the status of the purchasing agent, storekeeper, local operating officer, general management and so on. The greatest diversity exists. On some roads the material is bought, inspected, cared for and disbursed by the same officer; upon other roads the purchasing agent buys the material and delivers it to the operating officer; upon other roads the supplies, after having been bought, are turned over to a disinterested department, presided over by the accounting officer. It inspects and cares for the material and disburses on orders from operating officers. It is thus a check both on the person who buys and the person who uses.

Upon some roads local superintendents have no power to order material except through one or more superior officers. Upon other lines they are allowed to order directly from the storekeeper, the management striving in this way to make them sensible of the responsibility of their office; to fasten responsibility directly upon them. The practice is based upon a belief that the superintendent in charge knows better than anyone else the requirements of the service, and however much his requisitions may be scrutinized by superior officers, the latter are, after all, compelled to rely upon his judgment. If his requisitions are withheld or denied, the service suffers injury. No one but the official who personally watches the service on the ground really knows its needs. Where supplies are ordered, the greater the celerity in pro-

* Sometime ago one of the greatest railway managers of the United States asked the writer to prepare a code of rules and regulations governing the handling of material. The result is found in the chapter devoted to "Requisitions." In pursuing his inquiries the writer had occasion to investigate the methods of many railway companies, and while he nowhere observed intentional neglect or lack of interest, he everywhere found evidences of the slight thought that had been given the subject. The particular attention of the reader is invited to the chapter on "Requisitions." Under the rules therein laid down, the manager referred to was able to reduce his stock of material on hand twenty-five per cent, while greatly adding to the efficiency of the service.

curing them and the greater certainty the superintendent has that they will be furnished promptly and as ordered, the greater restraint (economy) he will exercise. Such is the line of reasoning the companies pursue, and upon it they are inclined to put great trust in the officers immediately in charge of the property. Some great and well managed corporations pursue the method I have described rigidly and systematically; they have found it to work with admirable smoothness and economy. It has been their experience that it builds up the morale of the force; that it also lessens the quantity and cheapens the kind of material they use. To those who criticise their methods they point to the fact that authority delegated to local officers may be withdrawn at a moment's notice if abused. Moreover, while local officers are granted the right to order material directly, their requisitions are always subject to the inspection of higher officials after they are filled, and before if necessary. So that the check is not withdrawn, but is so applied as to increase the responsibility of the local officer and build up in him a sense of dignity and responsibility. No service can be effective that does not keep this thought in view.

When a superintendent is required to secure the approval of those above him before he can get supplies, he is more intent upon getting his requisition filled than he is in restricting it to the lowest possible limit; he shifts the responsibility to the shoulders of his superiors. All officers do not, of course, do this, but it is in harmony with human nature where the discretion of men is not in accord with their responsibilities.

The questions that surround the subject of railway supplies are too numerous to be more than hinted at here. But the main purpose to be kept in view is to secure proper accountability in their purchase, care and use; to enforce needed safeguards; to prevent the growth of abuses; to stimulate the intelligence and zeal of every department interested; to be prompt in filling requisitions; to require full, minute and frequent returns; to keep advised, above all, of the quantity of material on hand and its location. The effective handling of material requires that when an article is ordered the department should know the quantity of such material on hand and where it is, so that the request may be filled by transfer from some other part of the road, if possible. It is of the greatest importance that those who buy and care for material should be thoroughly versed in such matters. This I have endeavored to provide for in the provision I have made for handling requisitions.

An important provision in connection with the economical and responsible use of material is that it shall be

charged to the account upon which used at the time of its use. In no other way is it possible for a company to keep itself advised of the quantity of material on hand; in no other way can those who look to the accounts for information know whether they have been loaded down in advance, or have been lightened by neglect to charge for the material that has been used. Any other system is apt not only to deceive the owner of the property, but the management as well. Owners of roads look to returns for a true exposition of their affairs—the actual surplus or deficit; the managers of railroads look to the daily, weekly or monthly returns for knowledge of details; they cannot carry such matters in their heads, and if the system of accounting is not such as to refresh their minds at the proper time and place, they will forget. For an officer to attempt to remember the details of what has passed is to greatly impair his knowledge of what is actually occurring round about him. If material is charged in advance of its use, the management will oftentimes forget that it is still on hand; if not charged when used, it will miscalculate the relation that expenses bear to receipts. Moreover, fictitious balances will be created whereby everybody will be misled—owner, investor, and manager. Material, like money, should be charged when it is expended. So long as it is on hand it should appear as an asset; when used it should be charged to the proper account. Unless these practices are observed, comparative statements lose their value. Material will be charged when convenient, and one of the greatest safeguards connected with the service, one of the greatest checks on the management, will be lost.

In reference to details, no two roads will agree. Differences in organization, in facilities, in location of shops, in methods of buying, in delivery and settlement, will exist. The differences, however, are not important. They will agree, or should agree, in regard to essential matters. There are certain general principles which ought always to be observed. These I purpose to discuss in this volume.*

* Further on herein will be found several chapters referring to material. The rules and regulations laid down therein must be substantially observed on every road where correct methods are followed. The volume on the construction and maintenance of railways also treats more or less specifically of material.

CHAPTER III.

THE PURCHASE AND CARE OF SUPPLIES—NECESSITY AND VALUE OF PERFORMING THE WORK SCIENTIFICALLY.

To handle material properly, a company must have a corps of storekeepers, skilled in the knowledge of railway supplies and faithful in the care and disbursement thereof; men who in inspecting are able to determine their character, and who may be trusted to make a true report thereof; men who will guard the property while in their possession and see that it is disbursed only for good and sufficient reasons; men who will, so far as possible, look after its disposition after it has passed out of their hands; men of sufficient judgment and experience to anticipate the wants of the service and direct the delivery of material at the point most convenient for its use. They must not only be trustworthy, but must be miniature merchants, so to speak, with the provident instincts of merchants. They are important factors in the working of a property. They must also be familiar with the material accounts of railroads.

They must be men of such character and judgment that they can be trusted to look after the interests of their employer without continual spur or special commendation. They must be honest, intelligent, experienced, vigilant. They must, however, have such adaptability of manner and disposition as to be able to live in peaceable accord with officials of the company about them, but over whom they have no control and from whom, in many cases, they will receive little or no aid. This involves tact and amiability. A company requires such a man at every supply store. To him subordinate and attendant details should be left; to him responsibility for the receipt, care and disbursement of material should be intrusted. Due efficiency requires that his clerical force and attendant laborers should be responsible directly to him, and that authority over them by others should be exercised through him. It is not necessary that a storekeeper should be intrusted with discretionary power to order material. He should, as a rule, act in such matters in co-operation with the operating officer immediately in charge,

unless, perhaps, it be in the case of a general storekeeper, who orders for all.

Men filling places of trust fall readily into a belief that a knowledge of the duties they perform, on the part of others, lessens their importance and loosens their hold. This is true of a mechanical office, or if the occupant is unfit. Not otherwise. It may be set down as true, that the more generally the methods of railways are understood, the more efficiently they will be managed, and the more profitable they will be to their owners. There is nothing about their system of operation that calls for secrecy, and the wider the diffusion of knowledge, the more thoroughly the community will appreciate the magnitude of the subject and the necessity for the work being carried on by owners according to approved methods of business. The importance of officials will not be lessened by publicity, and properties will be benefited.

In reference to the procurement of supplies, details cannot be too minutely pictured. They embrace a knowledge of the peculiarities and artifices of tradesmen, the fluctuations of markets, and the conditions that attend the production, transmission and use of each article. The list of goods that a railway company buys practically embraces every known article used in the economy of life. It is apparent, therefore, that any description must be largely general.

The practice of designating a particular person to buy the supplies that a railway company needs is not universal, though more prevalent than formerly. At one time it was the custom to permit the various heads of departments to buy. The practice was based upon the presumption that their knowledge of technicalities made them especially fit to buy advantageously. The argument was, however, fallacious. It ought not to require demonstration to prove that a person hired for his skill as a blacksmith is not likely to possess the qualities necessary to enable him to cope successfully with the veteran merchant in purchasing the goods that a blacksmith requires, or in disposing of the debris that accumulates about a blacksmith's shop. These duties are commercial and require a trader. It was found, moreover, that when purchases were thus made, the act was looked upon as merely an incident; something of minor importance and requiring neither skill nor thought. The result was neglect and improvidence. There was, moreover, enormous waste of material through excessive purchases and duplications of orders, while prices became greatly inflated, through either the ignorance or subserviency of buyers. These disadvantages were aggravated by the fact that in some cases the material bought and paid for was

never delivered—was purely mythical, in fact. This was rendered possible by making the department that purchased the material and the department that received, inspected and used it, the same; a doubtful practice under any circumstances, and one that should not be permitted except under special provisions and then for the moment only. These and kindred practices were not the result of design. No other way was known. It was not supposed that anyone who was lacking in technical knowledge of the uses to which a thing was to be put could buy it. Time has shown the fallacy of this.

The element that makes a purchasing agent valuable to his employer is the mercantile instinct. If he has the characteristics of an artisan, he should occupy the office of an artisan; the latter, however great his worth, is not qualified to cope with merchants, and his company will only be worsted in such an encounter.*

An essential requisite in a purchasing agent, and one that he ought to be fully alive to, is promptness. The operations of railroads are imperative, and while there is abundant opportunity to economize by cutting down excessive requisitions and canceling others, this process must not be allowed to interfere with the prompt filling of necessary orders. When it does, the service suffers thereby. The work must be done systematically. A supervisory duty of this kind requires an active, energetic, conscientious man, who has extended knowledge and abundance of time.

No one appreciates so heartily as the operating officers of a railroad the peculiar embarrassments that attend neglect to fill requisitions promptly. Neglect necessitates the use of unfit and expensive substitutes, and, in many cases, stoppage of work or the retarding of important repairs and renewals. Delay in the receipt of material that is needed also involves hurried and imperfect inspection when received, and a disregard of economical and responsible methods of distribution afterward. It involves not only loss, but confusion and scandal. Promptness is an essential requisite.

The more the subject is studied the more apparent it will become that, except under peculiar circumstances, the interests of a company will be enhanced by the employment of a particular man to buy its supplies. When they are purchased by many men the manager must, practically, assume the duties of purchasing agent through the minute and unceasing vigilance that he exercises over those who perform

* For fuller particulars of the characteristics of a good purchasing agent and the duties of his office, see chapter on that official in the volume on the organization of railways.

the duty. This but few managers have the skill, time or disposition to perform properly.

In order to buy advantageously, it is essential that orders shall be far enough in advance to afford the purchaser abundant opportunity to avail himself of the most desirable market. The field is wide, and requires both time and patience in order to take advantage of its opportunities. Undue haste is quite certain to add to the cost, and in many cases detracts from the value of the article purchased.

In order to buy cheaply, it is also important that the purchaser should be free to buy where he can to the best advantage. His duties require him to scrutinize the sources of supply constantly and intelligently.

In order to buy cheaply, goods must be paid for promptly. The usury that a company suffers for a disregard of this rule is out of all proportion to the benefits derived. A large percentage of the profits of many merchants arises from the discounts they receive or the penalties they enforce. The fact is fully appreciated by purchasing agents. It is not, however, so generally understood by their associates, and it results that this profit is oftentimes lost in consequence. The loss, however, it entails upon railroads is not so great as it would be in the case of small buyers. The purchases of railroads are so large and their credit is so high that they are able to purchase much cheaper than those who have not these advantages. This is especially so when the railroad company observes its obligations in regard to time and method of payment. Under the most favorable circumstances, however, there can be no doubt that the ability of a company to buy cheaply will be greatly enhanced by prompt cash payments.

In buying material the value of inviting bids, whenever possible, is generally recognized and acted upon. The exercise of this practice, when accompanied by careful and unceasing "shopping," has the effect of securing to a company every possible advantage that attends the purchase of large quantities of material in a widely extended market. The value of inviting bids is not dependent upon the quantity of goods bought. The difference in the price asked, even for a small thing, by different merchants and manufacturers, justifies it. Thus, in so small a matter as the purchase of stationery, the solicitation of bids will develop the most wonderful differences in prices; differences so remarkable that the aggregate amount that may be saved by judicious buying in the course of a year would not be believed by those who have not investigated the subject. The same is true of the purchase of lumber and other descriptions of material.

To buy cheaply and advisedly, it is essential that the

pulse of the market should be constantly felt. This necessitates extended correspondence and constant personal inspection upon the part of the purchaser. The systematization of railway business that is constantly going on renders it more and more easy each year to anticipate the current needs of a railway. One of the most effective avenues of buying cheaply is to publicly and generally invite bids from manufacturers and others for a considerable period ahead. This requires the preparation of careful estimates in advance, and the granting of considerable time in which to deliver the goods. The evolution in railway practice heretofore has not rendered this practice generally possible. The purchase of rails, ties and kindred staple articles has, however, formed an exception to the general rule. These supplies are of such magnitude and cost, and require so much preparatory labor, that it has, as a rule, been necessary that their use should be carefully anticipated and contracts made long in advance.

Some of the most carefully managed railroads invite bids by public advertisement for a year's supply of such articles as their known wants enable them to anticipate, without reference to the magnitude of the order. This secures the widest knowledge, and consequently general and active competition among sellers. It is in every way creditable to a company practicing it, and when supplemented or attended by active and unceasing "shopping," secures to the purchaser every possible advantage. While every railway company will derive benefit from the widest solicitation of bids, it is probable those companies remote from an abundant market will be more greatly benefited by such a course than others. Their necessities compel them to keep a large supply on hand, while their restricted market places them at a disadvantage in buying, unless through general and judicious advertising they invite the attention of the world to their needs.*

In conclusion, it may be said that the practices of railway companies in regard to the purchase, care and use of material cannot be too carefully scrutinized. The work is generally carried on intelligently by alert and experienced men alive to the requirements of the service. However, the subject is still imperfectly understood, and so long as this is so the service will suffer.

* "An essential feature, and one often overlooked by purchasing agents, is the necessity of merchants exercising promptness in filling orders after they have been placed. If storekeepers can depend on having their orders filled promptly, it will not be necessary for them to keep excessive stock on hand in anticipating delays."—*Writer on this subject.*

CHAPTER IV.

HOW FAR RAILWAY COMPANIES MAY PROFITABLY CARRY ON MANUFACTURING—SAFEGUARDS AND METHODS TO BE ADOPTED.

Railway corporations cannot manufacture as cheaply as private parties. The latter are not more discerning in the selection of agents, but more exacting afterward; more energetic, more economical, more quick to reward merit, more quick to discover incompetency.

The supervision of the Owner is immediate, personal and exacting. Moreover, the spur of competition and self-interest heightens the intelligence and intensifies the interest of the manufacturer. He is more careful in selecting the object of manufacture, and in keeping down cost. These facts are well known, and are the reason why railway companies buy from private parties rather than attempt to manufacture goods themselves.

There are, however, articles it is possible for them to manufacture to advantage. But the list is exceedingly small. It is only where the work is carried on as an accessory to something else that it can be done to advantage.

It oftentimes happens in the operation of railroads that the service of a given number of men is required in a shop for a particular purpose, not sufficient in itself to give them work all the time. If special work is not provided, the force is not fully employed, thus preventing the company from securing the class of workmen it needs or necessitating payment for idle time. Under such circumstances the manufacture of articles may be carried on to advantage, and while the cost may be greater than a company would have to pay on the street, still it will, as a whole, represent saving. Except under such circumstances, a corporation is not justified in manufacturing articles when it can buy in the open market.

There are more or less special, non-competitive articles that railway companies can manufacture economically; articles peculiar to them; devices used on their equipment and machinery; patterns that are not kept in stock by merchants and are not competitive. These articles have grown out of changes and improvements in railway appliances. Thus,

nearly every locomotive requires a particular pattern for some portion of its machinery; in other respects it may be of standard construction. Such patterns can, as a rule, be repaired or replaced more quickly and advantageously by the railway company, at the place where needed, than in any other way. The patterns multiply with the development of railroads. The attention that must be given them grows each year. They require a more or less extensive manufacturing plant upon every road.

In some cases railways rigidly restrict their work within the limits pointed out; to accessory work and the maintenance of articles that must be kept upon the ground to prevent the plant lying idle. This is the true basis of railway manufacture. The pressure, however, to extend its scope is constant. It is the outgrowth of widely different causes.

Manufacturing necessitates the employment of a greater force and greater plant than would otherwise be required. This aggrandizes localities and increases the importance of those in charge. The pressure, therefore, to multiply the uses of a shop is constant and pressing. There is nothing inconsistent in this with good faith on the part of the officials and operatives of a company. They felicitate themselves on their increased sphere of usefulness, and do not dream that it is at the expense of their employer. They do not know what the articles they manufacture cost; they know approximately, but not accurately. The methods of accounting in force upon railroads do not generally permit it. To determine it, the latter must take cognizance of every ounce of material used, whether new or old, and of every minute of time expended. Also all accessory items of cost, including transportation, superintendence, wear and tear of machinery, interest and kindred items. This involves an elaborate system of accounts, not necessary or of especial importance if a company restricts its work to those articles that it must manufacture, for reasons already given.

Accurate information is necessary in reference to the cost of every article manufactured. Private manufacturers possess this. No one can afford to manufacture an article without knowing whether he can do so as cheaply as others; whether he can do so at a profit or not. This is the test. Railroads rarely, if ever, possess this information. Their system of accounting is not devised for such purpose; not adapted to it. It takes no note of accessory or collateral items of cost. It takes reasonable account of the disposition of material and the time of men; its main purpose is to secure responsibility; prevent misappropriation or waste of material; prevent time being allowed employes in excess of that actually worked. It is not particular as to fractions of

cost. Not only is this so, but the weakness is aggravated by the disposition of foremen and others to reduce cost by fictitious means. There are many ways of accomplishing this, but the one commonly practiced is by using old material in the manufacture of new articles without accounting for it. No particular harm is done by this deception if it is practiced only in connection with articles that railways must manufacture, whether the cost is great or small. But when practiced under other circumstances, it has the effect both to deceive and rob the owner; to encourage him to carry on a system of manufacture that involves loss while apparently benefting him. It is very difficult to prevent undercharges of this character, for they are thought to be harmless by those who practice them. Yet the habit must be totally uprooted wherever a company enters into the manufacture of goods. But this latter should not be permitted except within necessary bounds. It may, perhaps, be carried on profitably under particular men or conditions for a time, but the practice will, ultimately, be unfortunate. The safe way is the best way, namely, to restrict manufacture to peculiar articles or work that is carried on as an accessory to something else.

The list of articles that a railway company may manufacture to advantage will depend upon the nature and extent of its property. Also, somewhat upon location. But it will be great in any event.

If locomotives, cars and the appurtenances of railroads were uniform, it would not be necessary for them to manufacture a single article. Their efforts would be confined wholly to repairs. Dealers would keep the market supplied. But lack of uniformity compels each company to provide facilities for repairing and renewing articles peculiar to it, without delay and where needed. It might keep duplicates of each article in stock to prevent machinery lying idle. But this would be impracticable. The number would be infinite and the cost prohibitory. Repair shops must, therefore, be located along the line so as to be quickly and easily accessible, where breaks may be repaired or simple articles renewed when necessary. They must be general in their use. This suggests an embarrassment.

For there is ever a tendency, natural and therefore excusable, to multiply facilities. This arises from a disposition on the part of petty departments to make special provision for their own wants rather than combine with others for the common good. The locomotive and car departments each need great central and subordinate repair shops, but further than this the call for such shops is exceptional.

By restricting the number of shops and enlarging their

usefulness, greater economy of labor and machinery can be secured than in any other way. An objection is that the work of one department will not be attended to by another as promptly as if carried on by the department concerned. This difficulty is not insurmountable. The trouble is not in concentration, but in lack of general interest, and the remedy lies in disciplining the delinquent, not in creating a new shop with its attendant machinery and expense.

The repair shops along a road, when systematically regulated, are graduated in importance from the petty shed with a blacksmith's bellows and forge to the central shops where all repairs and general renewals, so far as the convenient and economical working of the system will permit, are carried on. The small shops in their order are the avenues that lead those in charge to positions of greater importance, and teach them and stimulate their ambition. The necessity of harmony and subordination is imperative.

Each shop should be held subordinate to the one immediately above it and wholly so to the general repair shop, where all new work and general repairs should be done, so far as possible. Without constant watchfulness, the tendency, however, of each shop will be to make its usefulness general; to grow from an accessory into a system.

A great deal of thought has been given by manufacturers to means of ascertaining cost. No one appreciates so fully as they the importance of this. It is necessary among other things to enable them to put a price upon their goods. In its furtherance they have availed themselves of every device that the ingenuity or experience of men could suggest.

These devices should be carefully studied by storekeepers and accountants, and when a company attempts to do more than manufacture and repair articles peculiar to it or necessary to its convenient and economical working, measures for accurately determining cost should be vigorously enforced.*

Those in charge of accounts owe it to their employers to prevent any concealment of the cost of an article. Every opportunity should be taken to make it known to the management. It is the basis of responsibility. The duty is not discretionary, but imperative.

In the manufacture of goods, more or less material is ruined or damaged. The fact should not be concealed, but such disposition made as circumstances suggest. The practice of English roads in regard to damages arising from neglect of duty or awkwardness upon the part of operatives is

* For detailed instructions regarding the accounting required in connection with work of this nature, see the rules governing "Requisitions on shop foremen for manufacture of material," in the chapter herein on "Requisitions."

much more severe than in America, as their regulations evince.*

When the work of manufacturing is completed, measures should be taken to ascertain and make known the average cost. Comparison should, if possible, be made with similar articles. If the cost is excessive, or is thought to be so, the material used should be carefully scanned and the men engaged in the work interrogated, if need be. The investigation may not serve any useful purpose at the time, but will have the effect to suggest greater economy in future, if there has been extravagance. The value of supervision of this nature to a company is very great. It will restrain extravagance and bring to the notice of the management those who are efficient or otherwise.

Private manufacturers discover efficiency intuitively. Great corporations discover it more generally through the mechanical processes that exhibit results; through the accounts. These processes consequently are of especial value to them and should be regulated accordingly. If neglected, experience, capacity and faithful service will oftentimes remain unknown and unrecognized.

* "Any workman making any article of wrong dimensions, or finishing work in an inferior or unworkmanlike manner, must make good such work, and pay any extra expense that may be incurred, he being allowed the value of old material for such work spoiled. Any workman injuring a machine, or other article, through carelessness or neglect, shall pay the amount of the damage, and be fined two shillings and sixpence. Any workman knowingly making use of materials which are imperfect or otherwise unfit for the intended purpose, to pay all expenses incurred thereon, after the discovery of the defect."—*English Rule.*

CHAPTER V.

ORDERING SUPPLIES—NECESSITY AND VALUE OF PERFORMING THE WORK SCIENTIFICALLY.

In ordering the material and supplies required by a railroad company, it is desirable the storekeeper's knowledge should be supplemented by a wide experience; careful inquiry regarding probable requirements, thorough knowledge of the available stock on hand, and constant watchfulness. A record, showing the quantity of each kind of material on hand at specified intervals, and the amounts ordered and used from time to time, is indispensable in reducing to the minimum the average quantity of all kinds of material on hand. But while showing how much material has been required in the past, it will in many cases afford no adequate idea of the amount likely to be needed on account of extraordinary demands for repairs, renewals, construction, etc. For this reason the storekeeper must supplement his book knowledge by constant intercourse with the operating and other officers who use material, and anticipate their needs so far as may be possible.

As nothing that concerns the operating department of a company originates with those who handle its supplies, it results that they know nothing of impending wants, and it is only through those who control the work that they can keep themselves advised. The ability of those who handle supplies to procure this information and the intelligence they display in anticipating current needs are evidences of their fitness. If the methods of a storekeeper are imperfect, it will be observable in his work; his orders will be lacking in perspicuity, and he will find it necessary to supplement stated requisitions with frequent orders to meet unforeseen emergencies; material will have to be bought hurriedly, and at a disadvantage, to meet needed wants or to prevent the collapse of some department of the service.

The difference between a man who possesses executive talent and one who does not is the difference between a good storekeeper and a poor one. The former will anticipate the wants of the service with the same accuracy of judgment that a merchant anticipates the wants of his trade; if, how-

ever, he is lacking, his shelves will be loaded down with goods that he does not want, while there will be a scant supply of needed articles. A storekeeper of this kind will be a source of constant harassment to those about him and an expense to his employer.

Proper systematization of work requires that there should be stated periods for ordering material. Upon the majority of railroads a month's supply is all that is necessary to buy in advance. Too frequent ordering of material is objectionable on many accounts; first, because of the extra outlay it entails in handling the goods, and second, in attendant expense of accounting, payment, etc. Orders should cover such supply as can be conveniently, safely and economically stored, without involving depreciation or unnecessary locking up of a company's resources. No rule can be made. It will depend upon the situation of the railroad, the condition of the market, and storage facilities. If the road is remote, a larger supply will be needed than in other cases, because of inability to replenish the stock at will. If the market is a falling one, a management will confine its purchases to the actual daily requirements of the service. If it is a rising market, or promises to be so, the supply laid in will be such as the resources of the company permit, the nature of the material justifies and the probabilities of the market warrant. It is in such things as these that the management of a road evinces its sagacity. Success is measured by commercial instinct. If acute, it will be able to anticipate results; if dull or inattentive, the storm when it breaks will find it unprepared. It is the old story of fitness, with this added—that the men are not operating for themselves, but for others, and therefore lacking somewhat in self-interest. They are, moreover, not selected, in every case, under the most favorable auspices. They are often chosen hurriedly, and not always with a knowledge of men. They are also sometimes selected from the standpoint of the agent, rather than from the standpoint of the employer. Such things affect and give color to the organization of governments and corporations.

The organization of different railroads in connection with the handling of material is not the same, as I have frequent occasion to notice. Upon some, requisitions are sent directly from local officials to the purchasing agent or manager; upon others, they are sent to a general storekeeper. This last seems to me to be, on the whole, the more advantageous. The reason is, that the supplies of a company should be concentrated as much as possible. They should be kept at some central storehouse and distributed therefrom as local operating officers require, keeping at subordinate storehouses only the amount needed for the moment. The supplies being thus

concentrated, it follows naturally that the custodian thereof will possess a better knowledge of the material on hand than anyone else, and will, therefore, be better fitted than anyone else to tell how much it is necessary to buy, and how much may be procured by transfer between different storehouses.

When a company has a general or central storehouse, I think it would be a good plan to make all requisitions on or through the person in charge thereof. These requisitions may be sent forward by him afterward to the purchaser, with suggested changes. The effect will be to secure concert of action and tend to prevent purchases in excess of needs. It will remove questions as to supplies from the domain of speculation to a more solid foundation. The general storekeeper is the only one having practical knowledge of the subject. His duties are of such a nature as to give him accurate and early information. He sees the material, and his knowledge is immediate and personal. The greater use, therefore, that a company can make of him, the greater the efficiency likely to characterize the handling of its supplies.

Where there is a general supply store, it is desirable that supplies should be sent there for inspection and distribution whenever practicable.

The best method that can be devised for acquiring accurate knowledge of needed material will be defective. It will, therefore, be found necessary to make requisitions outside of the monthly requisition. Particular days should be set apart for these supplementary orders. They need not be many; say, two a month. On these days all orders that cannot await the usual requisition should be sent in. In addition to these, there will still be extraordinary necessities that cannot await any formal period. But if storekeepers are alert, these added requisitions will not be frequent. It does not alter the case that the storekeeper is dependent upon others for much of the information upon which he bases his requisitions. His ability to acquire this information is one of the evidences of his fitness. His methods must be such as the circumstances of the case require. He must use tact and avail himself of every opportunity in attaining the information he needs.

Not only is the intelligence of an officer evinced in the methodical preparation he makes for supplying himself with needed material, but also in the nature of such material; in his selecting that which, all things considered, is the cheapest and best; in his avoidance of that which has only outward show to recommend it for acceptance. Brilliant reputations are, perhaps, not made quickly in the exercise of economies of this nature, but their value to a property is very great, not only in regard to the saving effected, but in the

morale they foster. The great and permanent properties of a country are commonplace in appearance and substantial in structure. Strength and durability are prime factors. There is no likelihood that the picturesque needs of railroads will ever be disregarded; there is no danger, consequently, that the use of the commonplace and homely makeshifts possible in their operation will ever permanently disfigure them.

The wide discretion exercised by managers in filling requisitions for material has a tendency to create confusion and irresponsibility if not carefully regulated. In the first place, those who order supplies should be made to feel that they are expected to confine themselves to absolute needs; that grave responsibility attaches to them for lack of good judgment. It is only in this way that the growth of the competent and self-reliant men that a great corporation needs can be secured. If we pursue the processes of children with them, they will not be fit to exercise the responsibilities of men.

When a requisition or order is changed by the official receiving it, the person making it (no matter what his station) should be notified, and the reason given. Co-operation under any other circumstances is impossible, and both the self-respect of the man who makes the change and the man whose plans are altered will be increased thereby. The exercise of arbitrary power without explanation is always injudicious where co-operative effort is necessary. Every person in his place must be made to feel that his responsibility is co-ordinate and that he is entitled to, and receives, relatively, the same regard as others. Men thus treated attach great importance to their actions, and are careful and painstaking. At once there grows up in them not only the disposition, but the ability, to aid those who look to them. Due consideration of matters of this nature is pertinent to the subject and necessary to its elucidation. Wise managers recognize them, but they are neither known nor recognized by those who view the operations of corporations from a narrow standpoint.

There can be no doubt that the nearer those who simply serve are able to consider affairs from the standpoint of those who direct, the better agents they make and the more interested they are. This is the observation of men accustomed to direct the movements of others; of the general, of the politician, of the business man. Its recognition will be beneficial to railroads.

Another and an entirely different class of requisitions from those already referred to is that made upon storekeepers by foremen and others for material for work in progress.

These orders, experience proves, must be restricted to immediate and present wants.*

Charges against operating accounts are based largely upon the orders of foremen and others. When, therefore, more material is delivered than is needed for the accomplishment of a thing, the excess should be returned to the storekeeper or accounted for.

Economy will be greatly advanced by enforcing stringent rules in regard to drawing supplies from storehouses for current needs. The clerical work of making an order is often looked upon as a disagreeable duty. The disposition, therefore, is to make as few orders as possible, and to make them cover a great deal. The result is to withdraw the material from the care of the storekeeper, where it is looked after with such watchfulness as facilities permit, to a place where it has no care at all, or only cursory supervision at best.

It also follows, where excessive orders are permitted (and they are inevitable, except where constant watchfulness is exercised), that material procured for one purpose is used for another, and, while this may not involve actual loss, it occasions confusion in the accounts and renders it impossible to determine cost. The tendency is bad. Responsibility is evaded, as a company cannot tell whether work is being carried on economically or not. Foremen and others ordering material should be required to restrict their orders to known and immediate wants.

Orders for supplies for use upon trains and at offices and stations, and along the line, differ from those already noticed. They, however, require the same careful and intelligent scrutiny. If the orders are large, those who make them feel the responsibility. But in the majority of cases the amount involved is so petty that due attention is not given it. The necessity of economy is overlooked. Such orders make, in the aggregate, an enormous amount, as the expenditures of a company evince. Due efficiency, therefore, requires that they should be carefully audited before being honored.

Judicious "pruning" of orders for small supplies will not only prevent undue expenditure, but will tend to prevent loss or misappropriation.

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* It is the practice, in some instances, for storekeepers to deliver large quantities of material in advance of daily needs, charging the material, when thus delivered, directly to the thing on which it is finally to be expended. This saves the necessity of keeping accurate account of material as disbursed, and insures its being charged to the proper account. The practice, however simple and direct it may be, is not justifiable, no matter how much labor it may save the storekeeper, or how convenient it may be in accounting. Material not actually needed by workmen for immediate use should remain in the jurisdiction of the storekeeper, and should not be formally delivered to workmen, or charged to an account, except as it is actually disbursed for use from day to day.

It is impossible for anyone not familiar with the subject to appreciate the saving that can be effected by restricting supplies to present wants and by carefully ascertaining, after an order has been filled, whether the supply is made to extend over a commensurate period. Upon some railroads this surveillance extends to minute articles. Its exercise excites, as may be supposed, the most heated controversies between the storekeeper and his natural antithesis—the person ordering; the former accusing the latter of extravagance, and the latter accusing the former of parsimony and with crippling the service through his pinching economy. Such friction is healthy, if confined within reasonable bounds. It prevents undue penuriousness on one hand and wastefulness on the other.

There is, it is probable, no more ungrateful task connected with the service of corporations than the duty of passing upon requisitions and orders. However absurd or excessive, they are not esteemed so by those who make them, and any change or reduction excites their antagonism and chills their ardor; it is a reflection on their judgment, and they receive the rebuke according to their amiability or the thoroughness with which they have been disciplined, but always with bad grace. But the work is necessary if expenditures are to be restricted within reasonable limits. The examiner must take cognizance of every article used. He must commence with orders for equipment, ties and rails, and follow on down the ever lessening items to the most minute article. Each requisition must receive the measure of attention it merits, without reference to the outlay involved, for the reason that business may be harassed quite as much by the want of a necessary tool as by the absence of a bridge. The supervision must, therefore, be searching and discriminating.

The work must be conducted with judicial fairness; in a manner to invite confidence. The examiner must have a benignant temper; his patience must be equal to the most exacting requirements; his experience such as to fit him for the duty; his power of application commensurate with the tedious character and ungrateful nature of the work. No single person, it is manifest, can pass intelligently upon all the requisitions for supplies that a company needs. If the property is a large one, a man will have to be assigned for stationery and printing; another for lumber and kindred material; another for shop supplies; another for road supplies, and so on, according to the magnitude of the work. The fitness of a person making examinations is evinced quite as much by his ability to convince those whom he finds it necessary to overrule, of the justness of his action, as in the changes he makes, as it is only thus he can hope to prevent

a repetition of the mistake. He must not only be able to wisely curtail expenditures, but to enlist the hearty interest of others in his work. The latter qualification is rare.

If the duty of cutting down orders for supplies has a disagreeable side, it also has a bright one. There is, to a zealous man, probably no greater satisfaction than to think that through his unaided action he is saving his employer unnecessary expense. The performance of such a duty seems to measure the value of a man's service better than any other. He can, so to speak, count it in dollars and cents. The tendency, therefore, in him is to exaggerate; to consider the act rather than the office. His power tends to make him short-sighted; also selfish. He does not like to share the credit of his efforts with others. He takes pride in being able to guard his employer's interests single-handed. This feeling is exceedingly human. It is, however, none the less to be deplored; none the less narrow and short-sighted. Whenever it is necessary for an examiner to overrule an associate or subordinate, the part of wisdom is to share the credit with the latter. By doing so he will not only strengthen his purpose, but secure an ally. And allied interests are essential to the good government of corporations. Individual reputations may not be so readily built up in that way, but great properties can only be thus maintained. Permanent results are to be secured only by making a force homogeneous; by making persons subservient to the common good without destroying their individual interest; by encouraging an unselfish disposition to serve the property; by striving to eliminate envy and jealousy from the service. These last two vices are the curse of corporate life, the natural inheritance of arbitrary men; the outgrowth of fear. They retard growth and render men unfit to exercise offices of trust.

CHAPTER VI.

REQUISITIONS—HOW TO REDUCE THE STORES OF A COMPANY, THROUGH SCIENTIFIC ORGANIZATION, TO THE LOWEST POSSIBLE LIMIT.

[EXPLANATORY NOTE.—Requisitions may be divided under three heads: First, requisitions for the *purchase* of material to replenish the stock at the general storehouse;* second, requisitions for the *transfer* of material between storehouses;† third, orders on storehouses for material for *current work*.‡ This chapter explains the principles and rules to be observed in handling each.

A good form of organization provides, first, that all material and supplies should be bought by a purchasing agent, who should also dispose of scrap and other salable material no longer of use to the company; second, that all supplies should be received, inspected and stored at a central storehouse, in charge of a general storekeeper; and third, that stores of material at shops and elsewhere along the line of road should be in charge of local storekeepers under the direction of the general storekeeper.

Requisitions should be made on the official in charge at the general storehouse. He fills them from supplies on hand, if possible. Whenever supplies are needed to replenish the stock of the company, he makes a requisition on the purchasing agent.

However, the accompanying rules and regulations are not dependent for their value upon any particular organization; I merely outline an organization I know to be effective.

The title of Storekeeper is general; it represents properly all who have charge of the supplies of a company at the shops and along the line, or who render returns thereof. It also covers those who keep the time of men and render account thereof. Upon some roads the storekeeper will be the official immediately in charge of a storehouse or the person having charge of the time of men; upon another he will be a master mechanic, upon another a division superintendent, roadmaster, civil engineer, purchasing agent, manager, and so on. So that when the title is used it may mean any one of these officials or all of them together.]

PRINCIPLES GOVERNING REQUISITIONS.

Upon the efficiency of the rules and regulations governing requisitions depends the difference between economy and extravagance; between order and disorder.

The good of a service will be greatly enhanced if those concerned can be led to interest themselves actively and intelligently in the work.

If all who handle requisitions can be induced to exercise

* Form 1, Appendix D.
† Form 3, Appendix D.
‡ Form 4, Appendix D.

prudence, diligence and intelligence, the most satisfactory results will be attained. But if any considerable number fail to do this, improvidence and waste will follow.

Particular officials cannot make up for lack of interest among subordinates. A railroad is too big for one man to watch even in a limited department. There must be a general interest.

A manager is able to protect the affairs intrusted to him to the extent that he can enlist the hearty co-operation of those about him. This co-operation is to be attained, first, by selecting good men, and secondly, by wisely governing and trusting them.

The practices of railroads differ widely in regard to their methods of handling requisitions. Upon one line the requisitions of superintendents, master mechanics and others will be made on a general storekeeper, who honors them, if in his judgment proper, without further approval. If he thinks them unnecessary, wasteful or extravagant, he refers them to the proper officer for his action. It is a merit of the plan that it insures the prompt filling of requisitions. This is of the utmost importance. Officials knowing that their requisitions will be promptly filled cut them down as much as they can. They feel that the responsibility is a personal one, and endeavor to meet it fully. When, however, their requisitions are subjected to long delays and the scrutiny of so-called experts before being honored, the case is different; the responsibility is then transferred to someone else; they are, therefore, less provident; they habitually make requisitions in excess of needs to meet possible reductions and probable delays. The responsibility having been placed upon others, they thrust it from them. While not disloyal, they act as irresponsible people do in every walk of life.

I have found it best that the requisitions of master mechanics, superintendents, civil engineers and other trustworthy local officers be honored as soon as received. Afterward these requisitions may be subjected to the most careful analysis by the general manager and purchasing agent. If it turns out eventually that improvidence or poor judgment has been exercised in making requisitions, the delinquent may be reproved. If reproof is unavailing, he may be dismissed. Where the local official is a capable man, trusting him will make him better, and it is impossible to tell what he is until he has been trusted. In any event, momentary excesses on his part are as nothing compared with those he will commit if he knows that his requisitions will not be honored promptly, and that through this failure his work may be seriously crippled. Wherever such uncertainty exists, he will strive to provide against it by keeping on hand a much

larger supply of material than he would think of doing if promptness and definiteness were the rule.*

Some companies will not allow the requisition of a superintendent, master mechanic, roadmaster, etc., to be filled until it has been scrutinized and approved by one or more general officers. This requires time, and if the approving officer is absent or in doubt, the order lies on his desk for days, perhaps weeks, without action. Such delays are not matters of infrequent, but constant occurrence. The result is most disastrous. In every case the approving officer is more or less ignorant of the local situation. But he is zealous, and in his zeal to prevent waste or extravagance he hesitates or cuts down the requisition. The result of this procrastination and uncertainty is most unfortunate, as I have already pointed out; it compels those who use material to keep on hand a larger supply than they otherwise would. This is demoralizing to the service, and adds otherwise greatly to its cost.†

It has been the experience of companies that have abandoned the practice of requiring requisitions to run the gauntlet of general officers before being honored that such abandonment tended to secure greater care and economy upon the part of local officers in ordering; that it increased their sense of responsibility. Examinations made by general officers are at best only superficial. They create a false situation by building up responsibilities that cannot be sustained or intelligently enforced. The effect is to break down the esprit de corps of a service.

The time and place to enforce economy in the supply of material is when requisition is made on the purchasing agent to buy material; not when material is required for use. A master mechanic or superintendent that cannot be trusted to order supplies from a storehouse is unfit for his place.

The attempt of general officers to exercise personal surveillance over supplies retards business and heightens ex-

* The reader will notice that I continually return to this particular phase of the subject of supplies; to the fact that if requests are not filled promptly, or if they are not filled as called for and prompt notice of the fact returned to the person making them, the result will be to swell the amount of material that storekeepers will keep on hand. Local operating offices will not run the risk (even if their superiors are willing to) of being left without supplies to work with. Per contra, however, many well managed roads will not permit requisitions for material required for use to be filled until they have been passed upon by the head of the department and the general manager or general superintendent, or both.

† When a company requires requisitions to be approved by heads of departments and the general management before the material can be supplied from the general storehouse for use, provision should be made to have the work systematically and promptly performed.

pense. Of this there can be no doubt. It creates delay and uncertainty; fatal elements in business affairs.

Supervision is all the more effective when enforced indirectly. It makes men self-reliant and trustworthy, and no road can be operated efficiently without such men.

Responsible, capable, self-respecting officers can be made only by trusting men.

The foregoing covers generally a plan that I have found to work well in keeping down the supply of material and otherwise heightening the efficiency of the service. It is very simple. It cuts off all unnecessary circumlocution and fastens responsibility upon those officials who are familiar with the local wants of the property. The trouble with most systems of handling material is that they take too little account of the intelligence, interest and practical experience of local operating officers, whereas they are the only officers who really know anything about minute wants. Their responsibility and interest require to be heightened in every possible way, not deadened.

In reference to details, I would recommend:

First, that every act affecting the procurement or use of material should have the concurrent knowledge and sanction of at least two independent departments.

Second, that all material should be bought by an official designated to perform the duty.

Third, that all material that may be sold should be disposed of in like manner.

Fourth, that the right to order material should be restricted to certain operating officers of the company having practical knowledge of the needs of the service.

Fifth, that the receipt, inspection, care and disbursement of material should be intrusted to storekeepers under the instructions of a general officer of the company.

Sixth, that the principal storekeeper should be designated a general storekeeper and that all requisitions for material to replenish stock at local storehouses should be made on him.

Seventh, that it should be the duty of the general storekeeper to make requisitions each month for all material that is required to be bought, such requisitions to be approved by the general superintendent or general manager, or both.

Eighth, that so far as possible the supplies of a company held in reserve for operating and other purposes should be kept at a general storehouse in charge of a general storekeeper, so that only he need provide against the delays and vicissitudes that attend the purchase and delivery of material.

The effect of this concentration, coupled with the knowledge on the part of storekeepers that their orders will be

filled without delay, will keep down the supply of material on hand to the minimum.

The efficiency of the service may further be enhanced by employing an inspector to visit periodically the various supply depots of a company to see that proper care is exercised in inspecting, storing and disbursing, and that no more material is kept on hand than is needed.

In conclusion it may be said that no road can be operated either wisely or economically that does not take adequate measures to keep its store of material on hand as small as possible. In order to do this it is necessary to so simplify the question of the procurement of material that all who use it may know exactly what to expect.

RULES AND REGULATIONS REGARDING REQUISITIONS AND ORDERS FOR MATERIAL.

Material should not be ordered in excess of the amount necessary to operate the road efficiently and economically; supplies should not be piled up to avoid making requisitions or to meet contingencies that may never arise.

In making requisitions for material, due consideration should be given to the facilities for storing, the nature of the material, the distance from the source of supply, the quantity consumed, and the cost of handling and accounting.

In order to prevent excessive requisitions and the duplication of stocks of material, supplies should, so far as practicable, be kept at the general storehouse.*

Local storehouses along the line of road should only keep on hand such material as is needed to meet immediate wants —say a month's supply.†

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* In the event a company does not have a general storekeeper, the accompanying rules and regulations, so far as they specifically name him, are of course out of place. The officer, however, to whom requisitions are sent will take his place; this being understood, these rules and regulations will fit any situation and apply to any road.

† To keep the supply of track material along the road down to the lowest possible limit, it is suggested that the roadmaster compile lists of tools and supplies required to be kept on hand on each section, based on the standard of excellence which it is determined to maintain. This will vary on different parts of a road, but the lists should be as nearly uniform and as small as possible. The supply should be reduced on the sections as experience proves its expediency. Each section foreman should be given a copy of the list of tools and materials which he is required to carry, with instructions to renew his supply from month to month as necessary. At designated points on the road duplicates of such frogs, switches, etc., as may be likely to be required, should be stored: they should be so placed that they may be readily loaded on passenger trains, if necessary. (The shipment of such material by passenger trains should, however, be restricted as much as possible—being

In order to concentrate purchases, and for other important reasons, requisitions for supplies to replenish stock should, so far as practicable, be restricted to one a month.

The requisitions of storekeepers should be numbered in numerical order, commencing with number one on the first of each fiscal year.

Requisitions should state the amount of material on hand, the amount ordered but not received, and the additional amount required.

Whenever it is necessary to make intermediate requisitions the amount then on hand and due on previous requisitions should be stated as in other cases: the purpose for which the material is designed should also be stated.

In the event contracts covering a specified period are made with manufacturers or others for particular classes of material, such as castings, car wheels, etc., such material may, if more convenient, be ordered from time to time as needed, instead of monthly, as the practice requires in regard to other material.

So far as practicable, requisitions should be filled from supplies on hand or by transfer from one storehouse to another.*

In order to facilitate the procurement of supplies, when practicable, at the point most convenient to the place where needed, requisitions should state, so far as possible, where the material is to be used.†

To prevent rehandling, material furnished in car lots should be forwarded directly where needed, if it is practicable to receive and inspect the same at such point. But when material ordered by a storekeeper is sent elsewhere

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only permitted when the service would otherwise suffer.) This stock should be as small as possible, to meet the needs of the service in cases of emergency. A stock of such articles, which are not frequently needed, will thus answer for several sections. An article taken from stock should be replaced at once. A rule requiring the return of material not needed, and that scrap be collected promptly and forwarded in due course, should also be observed. Requests for material should be made monthly by track foremen on the proper officer, as in other cases; the latter should examine and consolidate these requests into one monthly requisition.

* It will sometimes occur, however, that while requests for material may be filled from the supply on hand, it will require, in order to do so, that the material should be transported into the neighborhood where it can be bought to the best advantage. In such cases it is manifestly desirable to buy the supply at the place where it is needed, except when the quantity on hand elsewhere is in excess of the needs of the service and may therefore be transferred with advantage. These facts require to be carefully considered and acted upon in every case in transferring material, and in making and filling requisitions.

† The articles covered by this rule will vary, but will not be numerous in any case and will be of the more bulky order; it will not be difficult, therefore, to enumerate them.

than as he directs, he should be promptly notified of the fact.

In ordering material the technical names of articles should be given, reference being also made to such drawings, pattern numbers, or illustrations thereof, as may be necessary to insure an accurate understanding of what is needed. In cases where the material cannot be satisfactorily described a sample of what is required should be submitted.

Officials should, in signing and approving requisitions, note thereon the date of such signature.

Requisitions should have the immediate attention of every one through whose hands they pass, and, when finally approved, the utmost celerity consistent with good business usage must be exercised in furnishing the supplies.

In the event articles are supplied in substitution of those called for, or if a request is altered, amended, canceled, delayed or action withheld, immediate notice of the fact, stating the reason therefor, should be sent to the person from whom it was received, it being the intent and purpose of a company that every one interested should be promptly advised of any delay or change in filling requests made by him, so that he may act intelligently. This rule is imperative and should be observed in every case without reference to the person signing the request or the person upon whom it is made.*

Old or partially worn out material, and all other substitutes consistent with the economical and effective working of the property, should be made use of in order to cut down purchases of new material as much as possible.

It is the duty of the general storekeeper and the purchasing agent to order such transfer of material in store on the line in excess of current demands as the good of the service requires.

All requisitions for the transfer of material or scrap should be sent through the office of the general storekeeper.

Storekeepers should be promptly advised by the proper official of all changes in patterns or designs of material, in order that they may avoid the accumulation of articles for which there is no use.

Storekeepers, foremen, and others in charge should keep a record from day to day, as the facts come to their notice, of material to be included in their next request.

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* Neglect to carry out this rule will be unfortunate on many accounts. In order to prevent the piling up of material on a road it is necessary, as I have already intimated, that every person in charge should feel that his orders will be promptly filled or that he will be advised. If he has reason to suppose that there will be any delay or uncertainty, he will keep on hand a supply sufficient to cover the contingency of such delay. The unnecessary accumulations of a company may, therefore, be measured by the delay and uncertainty that occur in the filling of requests for material.

Subordinates in charge of material at storehouses should be required to keep themselves advised of the supply on hand, and to promptly notify the storekeeper of any surplus or deficiency that may exist.

Storekeepers should, by frequent intercourse with operating officials, keep themselves advised of present and prospective wants of the service; otherwise their requisitions will require to be supplemented by many unnecessary requests.

All requisitions and orders should be preserved and filed away from day to day as filled; they are the authenticated vouchers upon which action is based, without which it would be unauthorized.

Samples of material for inspection or tests should be solicited from manufacturers and others whenever necessary to enable the receiving storekeeper to see that the goods delivered correspond with those purchased.

Results of all examinations made by the company's chemists and inspectors should be reported without delay to the general storekeeper and such other officials of the company as the good of the service requires or as may be directed.

It is the duty of storekeepers and others to keep a record of all comparisons, examinations and tests of material.

Reports should be made without delay to the general storekeeper, of all material received that does not come within the requirements of the contract under which it was bought, or which has failed to accomplish results guaranteed by the vendor. It is the duty of the general storekeeper in such cases forthwith to notify the purchasing agent.

Estimates made at the commencement of the year, for miscellaneous track material, lumber, etc., for the ensuing twelve months, should be accompanied by such statements and explanations as are necessary to enable the management to judge intelligently of their merits.

Material sent to shops for repair should be consigned to storekeeper, and plainly tagged, stating thereon where from, for what purpose it has been shipped, and the number of the requisition made to cover. Requisition should then be made forthwith, specifying the nature of the work to be done, and advising the disposition to be made of same when completed. It is the duty of the storekeeper, upon receipt of such a request, to see that no delay attends it; that the foreman or official whose duty it is to give the matter attention is notified, and that the article reaches him without unnecessary delay, and when repaired is forwarded forthwith as directed. It is the duty of all concerned to see that prompt disposition is made of matters of this kind.

REQUISITIONS FOR PURCHASE OF MATERIAL.*

No material should be purchased except upon requisitions of the general storekeeper, properly approved, except in the case of supplies, stationery, or printing required in the office of a general officer of the company; in the latter case, the requisition of such general officer should be sufficient.

Requisitions, when properly approved, should be sent to the purchasing agent to buy, with such suggestions as the good of the service requires.

Regular requisitions should be made on the purchasing agent by the general storekeeper each month on specified dates, for the purchase of necessary supplies and to replenish the stock of the general storehouse.

Special requisitions should be made by the general storekeeper as occasion requires, to fill requests received from superintendents, storekeepers and others for material not usually kept in stock, or which for some other reason cannot be furnished from the general store. So far as practicable, however, such requisitions should be filled from supplies already on hand.

These requisitions for the purchase of material should be carefully scrutinized by the proper officers, as it is at this point that the purchase of objectionable articles is to be prevented and orders curtailed within reasonable and necessary bounds.

In the event it is necessary to buy material to meet a pressing emergency, in other than the usual manner, a requisition covering the same should be made on the general storekeeper by the officer making the purchase, and the fact that the goods have been bought noted on the face thereof; also the account to which the material is to be charged. The bill of the goods thus bought should accompany the request. The general storekeeper should make requisition to cover and forward the papers through the usual channel to the purchasing agent, by whom the voucher should be made.

But no material should be bought except by the purchasing agent, in due course of business, upon requisitions properly made, except in pressing emergencies that cannot be foreseen nor guarded against, where the interests of the company would suffer by delay.

Vouchers upon which payment is made for material should in all cases be made by the purchasing agent, whether the request for the same is forwarded before or after the goods are bought.

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* Form 1, Appendix D.

No voucher for the payment for supplies of any kind should be made without the written acknowledgment of the storekeeper that the property has been received, inspected and accepted.

Should an emergency occur requiring the purchasing agent to buy material without a requisition, he should forthwith notify the general storekeeper of the fact, so that the latter may make a requisition to cover the same. The general storekeeper should note on such requisitions, "Already bought by the purchasing agent."

The form of requisition provides for the simultaneous filling up (by the use of carbon sheets) of three distinct forms, viz.:

Requisition of general storekeeper on purchasing agent for purchase of material.*—After taking an impression copy of this requisition it should be forwarded through the prescribed channel to the purchasing agent.†

Notice of material ordered by general storekeeper from purchasing agent.‡—This notice should be sent to the person who is to receive the material, for his information and use in checking the material when received. In case of delay in the receipt of the material he should address the purchasing agent in regard to it.

Record of material ordered by general storekeeper from purchasing agent.§—This record should be sent to the person to whom the invoice is to be sent, for his use in checking the invoice.

In order to keep those interested informed as to the progress of their orders for material, the purchasing agent should promptly notify them of the disposition made by him of all requisitions for the purchase of material.

To aid in the accomplishment of this purpose, the blank used by the purchasing agent in ordering material from the various merchants, manufacturers, etc., comprises three separate forms which are filled up at once by using carbon sheets, viz.:

Purchasing agent's order for material.°—This form is sent to the person or firm from whom the material is ordered.

Notice to consignee of material ordered by purchasing

* Form 1-A, Appendix D.

† When ordering supplies for the general store it is unnecessary to take an impression copy of the requisition. The "Notice of material ordered by general storekeeper from purchasing agent" may be given to the person in charge of the store room where the material will be received and checked, and the "Record of material ordered by general storekeeper from purchasing agent" may be retained as the office record and for use in checking the invoice.

‡ Form 1-B, Appendix D.

§ Form 1-C, Appendix D.

° Form 2-A, Appendix D.

agent.*—This notice should be sent to the person to whom the material is to be shipped. In case the material is not received promptly the matter should be taken up with the purchasing agent at once.

Purchasing agent's record of material ordered.†—This form is to be retained by the purchasing agent for an office record.

REQUISITIONS FOR TRANSFER OF MATERIAL.‡

One requisition should be made monthly, to cover the supplies required for the succeeding month.§ If, however, through omissions or the exigencies of business, further supplies are required, requests should be made for the same as needed. But it is desired that all supplies needed for the ensuing month should be embodied in the regular requisitions, so far as this result can be achieved by the exercise of care and foresight.

The general storekeeper should advise local storekeepers of the dates upon which their monthly requisitions are to be made.

Requests should not be made by telegraph except in extreme cases. In the event it is necessary, the telegram should give the number of the requisition which will follow. A requisition covering same should be made forthwith and forwarded without delay through the usual channel; across the face of such document should be written, "Already ordered by telegraph," giving date.

It is the duty of the general storekeeper to exercise a careful supervision over requests made on him for supplies, and in the event he should at any time be in doubt as to the advisability of filling a requisition, he should confer with the general manager in reference thereto and be governed by his advice.

The requisition blank is made in triplicate form, and by the use of carbon sheets the three copies may be made at one writing.‡ The original, after approval, should be sent to the official to whom it is addressed, and afterwards (in order to save the labor incident to transcribing the items of material shipped) should be used as an invoice by the person

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* Form 2-B, Appendix D.
† Form 2-C, Appendix D.
‡ Form 3, Appendix D.
§ As a rule, a month's supply should be sufficient. The smaller the quantity on hand, the less the deterioration and cost of handling, watching and inventorying. Also a larger stock tends to encourage wastefulness and extravagance in using material. It should not be forgotten, however, that the demoralization of the service and the extra cost entailed, occasioned by running short of material, are too great to warrant such a risk.

forwarding the material; the second copy should be sent to the person who is to receive the material; and the third copy should be retained for the office record.

No requisition should be returned to the maker by the official to whom it is sent for approval; he should note thereon his approval or disapproval and allow it to go through to the general storekeeper.

Requisitions for material for shop storehouses should be signed by the storekeeper and countersigned by the master mechanic or operating officer in charge.

Requisitions for material for tracks, bridges, buildings and similar purposes along the line should be certified to by the storekeeper in general charge of such material, and countersigned by the responsible officer in charge.

Requisitions which may reach the general storekeeper from any source without the prescribed approval should be forwarded by him to the proper official for approval.

All requisitions after being approved should be forwarded to the general storekeeper.

ORDERS FOR MATERIAL FOR CURRENT WORK.

Material should not be drawn from store except upon written orders made by or under the authority of officials in charge.*

Orders should in every case be dated and properly signed by the person authorized to draw same; they should specify in detail the articles required, quantity thereof, and the purpose for which required.

Orders should be carefully scrutinized by the storekeeper, and in the event they seem to be wrong in any way, the attention of the official in charge should be called to the matter.

Orders of foremen and others should be restricted to immediate wants, as material can be more effectively protected and guarded in store than elsewhere. Only such material therefore, as is necessary in the actual progress of work should be ordered at any one time.

All material disbursed for a particular purpose and not used therefor should be at once returned or accounted for to the storekeeper.

As the orders afford, in many cases, the most convenient medium for writing up the accounts and distribution books, the price of the material should be noted thereon.

In all cases when brasses, tools and implements of common use, etc., are ordered to replace worn out articles of similar kind, the storekeeper should require, in addition to

*Form 4, Appendix D.

the written order, the return of the old articles, or when this is impossible a satisfactory written explanation from the foreman or other person in charge, before delivering the articles ordered.

The form used in ordering journal bearings should, in addition to reciting the necessary particulars in regard to the quantity and kind of articles required, give the number of each on hand and the number returned.*

REQUISITIONS ON SHOP FOREMEN FOR MANUFACTURE OF MATERIAL.

When articles are to be manufactured at the shops of a company, a requisition should be made by the storekeeper on the official in charge, as in other cases. The form of requisition used for this purpose provides for the filling up of four distinct blanks, viz.: Requisition on shop foreman for manufacture of material† which should be sent to the official in charge of the shops for his approval, and for transmission by him to the foremen who will have the work in charge; General foreman's record of requisition for manufacture of material‡ which should also be sent to the official in charge of the shops, to be retained by him as a record; Storekeeper's record of requisition for manufacture of material,§ which should be retained for a record in the storekeeper's office; and Storehouse foreman's record of disposition made of material manufactured at shops, || which should be retained in the book by the person making the requisition. By the use of carbon sheets these four forms may be filled up simultaneously, thus saving time and clerical labor, and insuring accuracy.

A separate requisition should be made for each lot of material to be manufactured.° These requisitions (Lot Numbers) should be numbered in numerical order, as issued.

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* Form 5, Appendix D.
† Form 7-A, Appendix D.
‡ Form 7-B, Appendix D.
§ Form 7-C, Appendix D.
|| Form 7-D, Appendix D.
° In some cases, however, it will be advisable to make one requisition at the commencement of each year for the manufacture of a certain kind of material for stock, in order to avoid the large number of requisitions which would otherwise be necessary. Thus one requisition might be made for rebabbitting journal bearings, another for fitting up air brake hose, and so on. Whenever this is done, however, the foreman having the work in charge should, at the end of each month, send the storekeeper a report of the material completed during such month on account of each lot number of this class (Form 8, Appendix D). The storekeeper should then compute the average cost of such articles for the month named, which price should be used until superseded by another. Any unusual variations in price should be promptly investigated, as in other cases.

Since material and labor expended in repairing locomotives are charged directly to the locomotives on account of which the expense was incurred, the separate accounts being designated by the numbers of the locomotives, it is obviously desirable that distinctive numbers be given to lot numbers, in order to prevent the confusion that might otherwise occur if the numbers were the same. For example, if the locomotives are numbered from 1 to 1500, the lot numbers should begin with, say, 2000.

Upon delivery to the storekeeper of articles manufactured at shops, the storekeeper's receipt should be taken therefor, and a report of the transaction should be sent to the official in charge of the shops by the foreman last in charge of the work, or who delivers the articles to the storekeeper. By the use of carbon paper, both the "Report to general foreman of manufactured material delivered to storekeeper"* and the "Shop foreman's receipt for manufactured material delivered to storekeeper"† may be filled up at one writing. The latter form should be certified to by the storekeeper upon receipt of the articles, and should then be attached to the "Requisition on shop foreman for manufacture of material" by the foreman delivering the articles to the storekeeper.

As soon as all the articles have been completed, the foreman last in charge of the work should return the requisition to his superior officer, who will forward it promptly to the storekeeper.

All expenditures incurred in connection with the manufacture of each article or lot of material should be charged to the lot number assigned to such work.

The items should be entered in detail from day to day, as the expenditure occurs, on the forms "Storekeeper's record of material used in manufacture of material at shops"‡ and "Storekeeper's record of labor expended in manufacture of material at shops."§

To aid in preventing errors in reporting material used and labor performed on account of lot numbers, the orders and distribution slips should be printed on colored paper. This will also facilitate the sorting of the orders and slips for the use of the clerks making up the distribution books and computing the cost of lot numbers.

In order that the company may not be deceived in regard to its ability to manufacture cheaply, the utmost care should be exercised to see that every species of labor, material or

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* Form 9-A, Appendix D.
† Form 9-B, Appendix D.
‡ Form 10, Appendix D.
§ Form 11, Appendix D.

scrap that enters into the cost of an article, and every expense incurred on account of it, are properly computed and charged.

The proper proportion of the time of foremen, unskilled laborers, and others whose labor is not directly expended in the manufacture of an article, but whose labor is nevertheless necessary—indirectly—in the progress of such work through the shops, should be included in the cost of the material manufactured; also the proportion chargeable for wear and tear of tools and machinery, etc.

Material charged to a lot number, but which upon completion of the work remains unused, also any scrap or other material received during the progress of the work, should be properly credited to the cost of the work.

Upon completion of a lot number, the cost thereof should be accurately ascertained by the storekeeper. The expenditures as shown in detail on the "Storekeeper's record of material used in manufacture of material at shops" and the "Storekeeper's record of labor expended in manufacture of material at shops" should be summarized, showing the total quantity and cost of each kind of material used, and the total charge for time worked by each employe; and reported (in duplicate) on the form "Storekeeper's report of cost of material manufactured at shops."* Both copies of this report should be sent to the official in charge of the shops. If upon examination he finds same to be correct, he should approve the original (first copy) and return it to the storekeeper; otherwise the report should be returned for correction. The duplicate should be retained by the general foreman, and attached to the "General foreman's record of requisition for manufacture of material."

The cost of manufacturing similar articles should be compared, in order to see that the charges are correctly reported.

Whenever articles are manufactured at shops for stock, the average price of same should be computed and entered in the price-list. Such price should be compared with previous prices for similar articles, and any apparent discrepancies carefully investigated.

RAILS, TIES AND EQUIPMENT.

As the purchase of these supplies involves a large expenditure of money, relatively, and requires consultation and prior understanding among the general officers of the company, their procurement is made a matter of special moment by the management.

* Form 12, Appendix D.

Rules and regulations governing the ordering of other material will therefore apply only generally in this case—but formal authority should be required in every instance before purchasing or paying for such material.*

FUEL.

Coal for use in forges at shops by blacksmiths and others should be ordered by the storekeeper in charge as needed, and such requisitions should be handled in the same manner as the requisitions for other material and supplies.

In ordering fuel for use in heating station and office buildings, etc., a requisition for the estimated quantity required at each point should be made as far in advance of the time when it will be needed as may be necessary, in order that the purchase may be made at the most favorable time.

Such requisitions should be made through the division superintendent upon the purchasing agent, excepting at stations where large quantities are required for use in power plants, etc.,—the ordering of which is covered by special instructions issued by the purchasing agent.

The peculiar circumstances that attend the procurement, storage and disbursement of fuel consumed by locomotives suggest the necessity of particular provision being made for the ordering of supplies of this kind.

The necessity for an ample supply of fuel for locomotives is fundamental, and every safeguard should be used to avoid all danger of the embarrassment occasioned by a short supply.

It is evident, therefore, that the knowledge of the situation on different parts of the road should be centralized, and that all orders concerning the distribution of the coal as received from the mines should emanate from such center, so that the requirements of divisions of the road where the supply is low, or whose location is more remote from the sources of supply, may receive prompt attention.

To this end a report of coal received, disbursed and on hand should be required each day by the purchasing agent from the person in charge of each coaling station.†

From these daily reports a statement should be made in the office of the purchasing agent periodically, say every ten days, showing the quantity of fuel on hand at each coaling station, the average daily consumption at each point during the period specified, and the number of days the supply on hand at each point will last at such rate of consumption;

* The material should be invoiced, as in other cases, to the storekeeper in charge. It is his duty to inspect the same, and bring the charges upon the books.

† Form 26, Appendix D.

also the same information for each division of the road, and the totals for the road as a whole.*

This statement should be forwarded to the general manager, superintendent of motive power, and one copy retained by the purchasing agent for his use in determining the distribution to be made of the coal as received.

Agents at stations where coal is received from the mines or from connecting lines will be advised by the purchasing agent of the disposition to be made of same. In order to keep the purchasing agent informed as to the progress made in the filling of his orders, the agents at the receiving stations should be required to report to him daily the number of cars received, from where received, the number of cars forwarded, to what stations shipped, and the number of cars on hand not disposed of.†

In addition to the reports referred to here, reports should be made to the general storekeeper by those in charge of coaling stations, for his use in checking invoices for fuel and charging the disbursements to the proper accounts. These returns and the accounts in connection therewith are treated of in a subsequent chapter.

STATIONERY, BLANKS, BLANK BOOKS AND PRINTING.

Supplies of this kind should be purchased by or under the direction of the purchasing agent, as in the case of other material.

In purchasing supplies for this branch of the service. advantage should be taken, as in other cases, of the market and the competition of merchants and manufacturers. All orders should, so far as practicable, be submitted for competitive bids.

Regular requisitions for the purchase of stationery supplies for stock should be made on the purchasing agent by the storekeeper in charge on specified dates. However, additional requisitions may be made whenever the exigencies of the service require.

A separate storehouse should be provided for stationery supplies, blank forms, etc., where the general stock for the whole road should be kept.

Requisitions for supplies for current use should be made monthly on the storekeeper in charge, who should decide as to the propriety of honoring same, in the absence of definite instructions from the general officer in whose department the order originates. Such requisitions as are esteemed

* Form 27, Appendix D.
† Form 28, Appendix D.

proper and within reasonable bounds should be filled by the stationer without delay.

Care should be exercised in the storing of supplies of this nature, in order to minimize the loss from soiling, moisture, etc.

The value to a company of a competent and trustworthy stationer cannot be overestimated. He may save or waste a great deal without the fact ever being known.

In cases where generally similar blank forms are used in more than one department, a uniform blank should be provided which will serve the purposes of all, so as to reduce the number of different forms necessary to be kept in store.

For the same reason standard forms of letter-heads, envelopes, and other stationery should be provided which can be used in as many different offices as may be practicable.

All printed forms, blank books, etc., should be numbered consecutively, and requisitions for such supplies should specify the form numbers of the articles ordered.

No blank forms should be changed nor new blanks printed without authority from the general officer in charge of the department in which they are to be used.

In making requisitions for printed forms to replenish the general stock, samples of the blanks to reprinted should be frequently submitted to the department using same, for correction or alteration.

Suitable shipping boxes should be provided for use in forwarding the stationery required at stations and elsewhere. When empty these boxes should be promptly returned to the stationer; such instructions should be stenciled on the boxes.

SUPPLIES FOR DINING, BUFFET, PARLOR AND BUSINESS CARS.

The general rules regarding the ordering and purchasing of supplies for stock should be enforced in this branch of the service so far as possible.

One requisition should be made on the purchasing agent by the storekeeper monthly for all non-perishable supplies, such as liquors, cigars, canned goods, staple groceries, glassware, china, cutlery, linen, and kindred articles.

Requirements of this nature not provided for in making the regular requisition may, however, be covered by special requisitions whenever the exigencies of the service demand, but by the use of care and foresight such requests need not be frequent.

Perishable supplies, such as milk, cream, butter, bread, vegetables, fresh meats, eggs, fish, etc., may be purchased

from day to day as needed by the superintendent in charge of this service or such person as may be directed. The superintendent should, however, make a formal requisition on the purchasing agent to cover invoices for supplies of this nature as often as required, sending same to the proper officer for approval. The vouchers in payment for such supplies should be made by the purchasing agent, as in the case of other classes of material.

Orders of conductors for supplies for use on these cars should be restricted to immediate needs, and care should be exercised to avoid the loss and waste consequent upon overstocking cars with supplies of this kind.

Conductors' orders should be approved by the superintendent in charge of this department before being filled by the storekeeper. The form of order used for this purpose is designed to save clerical labor in writing the order, the names of the different articles and supplies used being printed in the blank, so that all that is necessary in writing the order is to insert the quantity on hand and the additional quantity ordered in the spaces provided opposite the names of the articles.* By the use of carbon sheets, a record of the order may be made at one writing, to be retained by the conductor.

In cases of the failure of the stock of supplies on board a car during a trip, the conductor in charge of such car should purchase necessary supplies from such firms as may be designated by the superintendent of this department. Conductors of cars of this class running between points remote from the storehouse should also be authorized to purchase such supplies as cannot be advantageously furnished by the storekeeper. All purchases made under this rule should be reported by the conductor promptly at the end of each trip; original and duplicate bills should be required from the firm supplying the articles, which bills should be certified to by the person in charge of the car and sent to the superintendent of this department without delay, for his approval. All such bills should then be given to the storekeeper, who should make requisitions on the purchasing agent as often as required to cover all items of this nature.

THE STOCK BOOK.†

Stock books should be used by all persons who are in charge of and responsible for stores of material and supplies, in order to enable them the better to keep in touch with the stock on hand and to afford them a basis upon which to

* Form 6, Appendix D.
† Form 13, Appendix D.

compile their monthly requisitions.* By their use the quantity of material in store may be reduced to the minimum, since the record will show what the actual requirements have been from time to time and at particular seasons.

By taking care to have all material on hand shown in the stock books it will be easy to determine just what is surplus and the amount of such surplus material on hand will be kept continually before the storekeeper; such material will thus be more likely to be used to the best advantage whenever a suitable opportunity offers—otherwise it may be lost sight of and forgotten.

In order to reduce the stores of material along the road as much as possible, the monthly returns of material on hand should be carefully scanned by the general storekeeper. To further this purpose and for other reasons storekeepers should send their stock books to the general storekeeper immediately after writing their monthly requisitions. By examining and comparing the requisition and stock books, the general storekeeper will be aided in disposing of the requisition, as he will be enabled to inform himself as to the different kinds of material on hand, quantity, consumption, etc. If the amount on hand is excessive in any instance, he should make such disposition of it as the good of the service requires. It will also enable him to keep track of old material, material no longer in use and other supplies requiring disposition. It will be seen from this, therefore, that the stock books should be carefully written up, so as to afford a full and complete record of material of every kind on hand.

For convenience in handling and to permit several persons to be engaged in counting the stock at once, it is advisable to have the stock books limited in size to about 24 leaves, using as many books as may be required.

The following rules governing the use of stock books should be observed:

The stock books should contain a complete record of all material and supplies on hand (not in use), and of all material ordered and manufactured at shops, including tools and machinery.

The stock books should be written up each month just before making the regular requisition, and should be forwarded to the general storekeeper promptly after making the monthly requisition. As soon as the general storekeeper has examined the stock books he should return them. The

* In the case of trackmen the regular Track Material Book (treated of elsewhere herein) will generally prove sufficient. However, at all points where there is a comparatively large stock of material and supplies, stock books may be used with advantage.

examination should be made within five days after their receipt.

Each storehouse should be divided into sections. When practicable, sections should be indicated by a letter or number, and the books marked accordingly.

An index should be provided for each set of stock books, giving the names of all articles of material on hand, with reference to the number of the book and page where recorded.

Columns for thirteen months are provided so that the record of material on hand and ordered for the last month of the preceding year, as shown in the old stock book, may be entered in the new stock book. This is done in order that a comparison may be made when making up the succeeding month's requisition, and to afford the general storekeeper information as to the stock usually carried, without the necessity of referring to the old stock books.

Names of Articles.—In this column should be written the technical names of the articles of material on hand or to be ordered, giving pattern number or reference to drawings whenever an article is so designated. All material should be accurately described, so as to prevent errors in making and, later, in filling requisitions. The different articles of material should be entered in the stock books in the same order in which they are arranged in the storehouse, so as to facilitate the counting of stock each month.

Classification of Material.—Material at the general storehouse should be divided into several classes, according to the location of the stocks of the different kinds of material. In this column should be entered the letter designating the section of the general storehouse where each item of material is stored. Separate requisitions should be made for each of such classes of material.

Inventory.—At the close of the fiscal year the stock on hand should be accurately ascertained, the quantity being entered in this column, and the price and amount of each article being entered in the spaces provided—using for this purpose the stock books for the ensuing year. The inventory should then be written up from the stock books. In entering the quantity on hand in this column for the inventory the denomination used should be that upon which the price is based (as "dozen," "pounds," "gallons," etc.)

Quantity on Hand.—In this column should be entered the quantity of each kind of material on hand, using the same denomination as is used in ordering. Old material on hand which is usable should also be entered in this column, and designated as such by the notation "2d Hand."

In this column should also be entered (in red ink) all material which has been ordered, but not yet received.

The date the stock is counted should be inserted in the space provided at the top of each column.

In the case of material in bulk, such as bolts, nuts, chain, cotters, gaskets, paint, rivets, washers, etc., the storekeeper is at liberty, in writing up the stock books for the monthly requisition, to estimate the amount on hand. The estimate, however, should be made in every case after personally viewing the supply. Whenever possible the actual amount should be given. For the yearly inventory, however, the quantity should be accurately ascertained in every case.

Quantity Ordered.—In this column should be entered the quantity of each kind of material required. This quantity should be determined after a careful consideration of the amount on hand and due from previous requisitions, compared with the amount required in previous months and at similar seasons.

Material ordered during the month on special requisitions should be entered in this column in red ink, and the date of such requisitions shown.

Articles ordered to be manufactured at the shops should be entered in this column with blue pencil. Material received from other sources besides requisitions and orders on the shops should be entered in this column and underlined with blue pencil.

CHAPTER VII.

INSPECTING, RECEIVING AND CLASSIFYING SUPPLIES.

The importance of inspecting material properly is apparent. It is not enough that supplies are bought judiciously. Intelligent measures must be taken to see that what is bought is received. The duty of inspecting the material of a railroad requires accuracy, intelligence, and a technical knowledge of the thing inspected. These are not to be found in any one man. Different inspectors will be required, possessing particular knowledge of the thing they inspect. They must be men of a high order of integrity, and of a disposition that cannot be inveigled into describing a thing otherwise than as it is. These qualities are not rare among the employes of railroads, and capable inspectors are not difficult to find, but the qualifications needed must be kept in mind in making selections.

The clashing that is inevitable between seller and buyer as regards quantity and quality of goods delivered is greatly lessened when the office of inspector is worthily filled. He has the confidence of those with whom he deals. They accept his statements. He, however, none the less avails himself of every incident connected with his duties that will enable him to convince the shipper of the accuracy of his inspection.

It cannot be too strongly impressed upon inspectors that the good of their employer requires that they should be entirely fair in their work. A company's interest can never be advanced by attempts to defraud the seller. Honesty, in this as in everything else, is the only policy and should be the standard. A contrary course quickly creates suspicion, rendering merchants unwilling to sell on as favorable terms as they otherwise would; they will take measures to protect themselves, and will offset the dishonesty of the inspector by unfair means in other directions; quite likely by bribing the inspector himself. Indeed, such attempts may be made without any precipitating cause, but they are not so likely to occur if the company is fair and the inspector straightforward.

The danger, however, that inspectors may be improperly influenced, requires that the greatest care should be taken in selecting them, and in governing them afterward.

Venality in the purchase of supplies not only involves payment for inferior goods, but for goods never delivered. The former is worse than the latter. It is more difficult to detect and involves a chain of disastrous consequences. Thus, by the receipt of an article of oil inferior to that purchased, a company is not only swindled as regards price, but its use injures the machinery, and perhaps precipitates an accident, to the great pecuniary loss of the company.

These things may not occur, but prudence requires that provision should be made to prevent them; the most effective measure is the exercise of good judgment in selecting inspectors, and their systematic government afterward.

It may be set down as a fact not to be disputed that an inspector who will defraud a seller will also defraud his employer if he can derive benefit therefrom.

The disposition of men to seek opportunity to do an unjust thing on behalf of their employers may be accepted as an evidence of instability.

The safety of corporations depends upon the just action of their servants, and whenever one of them construes it to be his duty to lie or cheat on behalf of his employer, he will, with equal facility, lie or cheat in his own behalf if occasion arises. His virtue will not be able to resist the first onslaught, and his seduction and abandonment are only a question of days or weeks.

The duty of inspecting railway supplies should be performed with the same intelligence and care that it would if the thing inspected were owned by the inspector.

There can be no higher standard than this.

The inspectors must be honest, experienced, discerning; men of resolute character. Their experience and talent must be commensurate with their work. They must be able to resist insidious attentions and flattery, as well as open bribery.

They must be sufficiently skilled to be able to judge of the qualifying features that attach to the material they inspect.*

Inspectors will be variously tempted. It will not do for them to place themselves under obligation to those with whom they deal; to subject themselves to suspicion is fatal to their usefulness.

The duties of inspectors of track material, timber, fuel

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* Thus a knot hole may not be objectionable in a tie if not located under the rail; shrinkage in the face of the tie that might not be objectionable in one place would make it unfit for use in another. They must understand the peculiarities of timber embraced or implied under the heads of shakes, wanes, cracks, splits and other attendant conditions; the peculiarities of metals, varnishes, oils, paints, fuel, etc.

and kindred supplies are usually arduous and perplexing; they must be hardy of frame and thoroughly skilled. It is said that there never were two ties or pieces of wood exactly alike. Inspectors must constantly possess a thorough knowledge of such material and the use it is to be put to in order to inspect it accurately; to be able to judge rapidly and correctly as to its class and disposition, and to detect at a glance the tricks of dealers.

They must be men of strong character, with confidence in themselves; even tempered, sober and fearless, doing what is just to the buyer as well as to the seller; what is just and fair as between man and man.

As regards details of inspection generally, if material is deficient in any way, either as regards quantity or quality the fact should be entered on the invoice; or if this document is not at hand, the particulars should be noted elsewhere with a view to their final insertion on the invoice.

The practice observed, when material does not conform to the purchase, is not uniform. In some cases it is returned; in others it is held to await further correspondence. Sometimes such use is made of it as the exigencies of the service allow. The only safe course is to insist upon the delivery of that which is bought; any other entails confusion and possible loss. Circumstances will, however, arise where articles will be delivered unintentionally by the seller that do not meet the requirements of the purchase, that can be used in some other way without detriment. In cases of this kind they should be laid aside and the facts reported to the proper official for decision. If favorable, the exact nature of the material should be noted, and the record book and the invoice made to conform thereto.

A large proportion of the material that is bought requires that a sample should be sent to the storekeeper, to enable him to inspect it intelligently. This practice should be observed. It is only by such a course that sellers can be held to a rigid accountability. The great difference in the kind of goods furnished by different men, or the same men at different times, renders accurate inspection impossible without samples.

While care is always required to be exercised in inspecting and receiving material, it is manifest that greater responsibility attaches when the material is received from a seller than when received from a company's storehouse. Mistakes or omissions in the former case may involve loss in many directions, and are certain to breed demoralization if not discovered and corrected, whereas if the material is simply transferred, the circumstances attending its receipt and inspection are not so important. However, efficiency

will be promoted if the work is intelligently and methodically performed in all cases, and all discrepancies carefully noted and reported.

In receiving goods it is desirable, where the name of the manufacturer or seller is not plainly branded on the article that some mark shall be placed thereon that will facilitate its identification afterward, in the event it should prove to be defective or otherwise than as agreed upon. In the case of bar iron, this may be done by painting the end or a portion thereof with some distinctive color. It will never be difficult for the storekeeper to find some simple and effective way to mark material, so that it may be afterward identified.

The practice of accepting material before it is unloaded is not a good one.

Material should be inspected in detail, as it is unloaded and placed in the storehouse. It will frequently be necessary for the inspector to ask the advice of foremen and others having practical knowledge of the articles he receives. Judicious use of such information, in doubtful cases, cannot but redound greatly to the efficiency of the work.*

Details in regard to inspecting material can only be generally referred to. Each class of material possesses characteristics peculiar to itself which must be taken into account by the inspector. To attempt to define the duties of the examiner in detail would, in many cases, require an accurate technical description of the article used—an absurd and impossible task.

One or two practical illustrations of details connected with the purchase and inspection of material may, however, be inserted here for illustration. Thus, Lids for ties:

"All ties must be well and smoothly hewed or sawed out of sound, straight, thrifty timber; must be eight feet long, with sawed ends; must be uniformly six inches thick between the faces; each face side to be six inches wide or wider at the narrowest place, inside the bark, and the faces to be straight, truly lined and parallel with each other. If ties are sawed or split from large timber, they must not be less than six inches thick between the faces, nor less than eight inches wide on face side, and must be free from wane, shakes or unsoundness of any kind. The ties to be delivered on ground at or above the grade of the railway track, and within thirty feet of same, subject to the inspection

* It has been suggested that where a company's supplies are not delivered at the storehouse, it should have a room in charge of a storekeeper, so as to facilitate inspection under the eye of both seller and purchaser; a thing impossible when a company does not accept material until its arrival at an interior point.

and count of the purchasing agent, or any authorized agent of the company, whose action in counting and receiving or rejecting the ties offered shall be final and conclusive; inspection will be made once a month, or oftener if required, and payments will follow within thirty days thereafter. The purchasing agent will furnish, upon application, the necessary blanks for making proposals. All persons desirous of furnishing ties on the above named terms and conditions will make application to the purchasing agent, who will issue permits; no person will be allowed to place any material on the right of way of the company without special permit to do so."

And for wood:

"All cord wood to be well manufactured out of sound, straight, thrifty timber; to be cut four feet in length, measuring half the kerf, to be well corded in single or double ranks, six feet or eight feet high, the ranks not to be over two hundred feet in length, a space to be left at the end of each rank of at least eight feet before commencing another pile; the wood to be piled on longitudinal sticks sufficient to keep it from the ground, and in all cases to be piled on the ground at or above the grade of the railway track; the end of each rank to be substantially stayed by a good abutment; a space three feet wide to be left between the ranks, if piled in single ranks, or the same space between every two double ranks, if piled in double ranks, so that a man may pass conveniently through for the purpose of inspecting and measuring the same; no round wood to be delivered that is more than four inches in diameter, or less than three, and no split wood that exceeds six inches in greatest through measurement; no wood to be piled within one hundred feet of a crossing. Hard and soft woods must be piled separately. The said wood to be delivered subject to the inspection and measurement of the purchasing agent or any other agent of the company, duly authorized to inspect and measure the same. The decision of the said purchasing or other authorized agent, in regard to the inspection and acceptance of the wood delivered, and the measurement of the same, or in regard to the rejection of the whole, or any part thereof, for non-compliance with these specifications, shall be final and conclusive. Measurements will be made monthly, and, until measured, the wood will remain at the risk of the owner."*

In receiving merchandise at stations, consigned to merchants and others, the goods are compared item by item with the way bills as they are unloaded from the car, and all

* Railway companies usually have special inspectors for ties, fuel, etc. The subject of Inspection is referred to more at length elsewhere herein.

marks and references to excesses, deficiencies, damages, etc., noted. This practice has been found to work well, and it would seem to be a safe plan to follow in receiving material, except that the invoices are used instead of the way bills.

Discrepancies are more likely to be noticed, and accurate account taken thereof, if goods are compared with the invoice as received and tally marks and notations indelibly marked thereon at the time; the number of the car and date received should also be inserted.

If the invoice has not come to hand when the material is received, the record of the requisition may be used. There should be entered on this record the date of receipt of goods, the number of car and the name of the party from whom bought. Afterward, when the invoice has come to hand and been receipted and returned, the fact should be noted on the record. All these details should be inserted on the record in any event. They will prevent the certification of duplicate invoices and other irregularities.

The absence of the notations on a record, moreover, will be an indication at all times that the material has not been received or has not been invoiced.

The use of original sources of information of this kind saves clerical labor, and avoids dangers likely to occur when copies are used.

Too great care cannot be exercised to surround the recording and signing of the invoice with proper safeguards, as this instrument forms the basis of the voucher used in paying for the goods. I would not only note the particulars of the invoice, and the signing thereof, as described above, but also further record the fact in the Material Book, thus rendering it doubly impossible to sign unwittingly a duplicate invoice.

I also attach great importance to the use of the original invoice in receiving and inspecting goods. Its possession enables the inspector to devote his whole time to the examination of the goods, whereas, this duty becomes much clouded and in many instances of secondary importance if he must at the same time perform the clerical work of entering the details of the goods in a blotter as he receives and inspects them.*

The value of the invoice to the inspector renders it important that it should reach him at least as soon as the goods; no delay should occur in forwarding it. It should be made on or before the loading of the goods for shipment, and should be sent forward forthwith by passenger train. Its receipt by the consignee is thus assured simultaneously

* A receiving book may also be used and is in many cases. It facilitates the designation of particular lots received from teamsters, etc.

with or before the arrival of the goods. In the event the invoice is not received in time for use in receiving and inspecting the material, the details of the latter should be entered in the blotter and Material Book, and a note thereof inserted on the requisition record as pointed out.

To facilitate the receipt of material at points away from storehouses, the original invoice should be sent to the place where the material is to be delivered, so that it may be used in inspecting and receiving, as in other cases. A duplicate should be sent to the storekeeper against whom the material is to be charged. When the original is thus forwarded for use in inspecting, there will be no necessity for a memorandum book being kept at the point of delivery. It must be impressed upon the foremen and others receiving material under the circumstances named, that the utmost care must be observed in inspecting and counting, as imposition is much more likely to be practiced under such circumstances than in other cases.

While material must be personally inspected in every instance, it is only by comparisons frequently, that its nature can be determined. The method of comparison is suggested by the article. Thus, different varnishes and paints may be placed side by side on the same structure. Such comparisons are simple and effective. There can be no escape from their conclusions.

Each day the work of inspecting railway supplies is being simplified by the use of laboratories and other devices. They not only prevent imposition being practiced, but relieve operating officials of much mechanical work that at one time devolved upon them. In the early history of railways, superintendents and others were called upon continually to decide scientific questions without preparatory knowledge. It is needless to say that their decisions were uncertain and unsatisfactory. The organization of testing laboratories has measurably relieved them. Speaking of the duties and value of this new departure, a committee of master mechanics, selected to consider the subject, says:*

"The organization and conduct of a laboratory for testing material is one of the most delicate specialties connected with railway work, and it is possibly owing to this fact that the growth of the testing department idea has been slow. The degree of benefit to be derived from the department depends directly upon the ability both in theory and practice of the men put in charge. Since the investigations required are both chemical and physical, scientific and practical, it will be seen that the chief must be somewhat versed in all

* Committee of Master Mechanics' Association, composed of Messrs. George Gibbs, David L. Barnes, George W. West and L. S. Randolph.

these branches. It is not desirable that he should be a specialist, but rather a man with good theoretical and practical education, trained to accurate reasoning and of sound judgment; he should have had broad experience and be able to generalize from the reports of his subordinates in such a shape that his statements will relieve his superior officers from the necessity of going into details. He must be able to plan methods of testing and experimenting and see that they are properly carried out. . . Much valuable time has been frittered away in testing laboratories by the practice of taking up work which would, of necessity, not give satisfactory practical results, or which, when obtained, are insignificant in value to that of the time wasted in arriving at them. . . . A list of the subjects which can, in our opinion, be profitably undertaken and which will produce results of practical value, embraces: First, routine—physical and chemical work; testing shipments of material kept in stock and bought under definite requirements; second, special work—such as tests of the efficiency of machines, fuels, improvements in mechanical construction and patented devices (whether conducted on the road in actual trial or in laboratory); trials of water purification; tie preservation methods, and others. In the field of 'special work' are embraced those subjects which admit of professional opinion without actual experiment, and for such the experts connected with the department draw upon their knowledge of the engineering practice of the day. . . . The first matter of importance which will engage the attention of the head of such a department is establishing standard specifications for material bought regularly and in quantity. It is a matter requiring the greatest delicacy and knowledge of all conditions in the use as well as the manufacture and market from which the supplies are drawn. . . . The first aim in framing specifications should be to obtain completely the requisite standard for quality, neither more nor less, and in so doing to encroach as little as possible upon the freedom of the purchasing department in obtaining as wide a market as practicable to buy in. . . . A careful study of the method of manufacture of a material will often suggest some simple means of compelling adherence to the best methods. After establishing the requirements thought necessary, the views of the purchasing agent and the leading manufacturers should be obtained as to their practicability and influence upon market supply. A standard specification should in no sense be considered final, but must be subject to alteration from time to time, as the market supply varies and as service reveals weak points. In receiving materials bought under specifications, samples must be taken representing a certain

definite percentage of shipment and acceptance made subject to sample under test. This percentage taken will vary with the nature of the material and a consideration of the chances of error introduced. In buying under specifications, the purchasing agent should maintain a close consulting relation with the testing department as to the uniformity and reliability of the material from different manufacturers. The head of such a department, keeping a close watch of the material under test and under all conditions of manufacture and use, should be able to draw valuable conclusions, to be obtained in no other way. The relations between the purchasing and testing (inspecting) departments of a railroad should be close and cordial."

The practices of English railways in regard to handling supplies are generally the same as in the United States. An officer known as the general stores superintendent ascertains the wants of the service and the best channels of supply. He negotiates the purchase of material and fuel; also the sale of old material. The terms and conditions of purchase or sale are submitted by him to a committee of the board of directors for its decision. When it approves the purchase or sale of material, he issues the order and sees that contracts are observed. Coal, coke and other supplies, not subject to frequent fluctuations in price, are bought under contract. For convenience of storage and distribution, the material department is divided into four or more principal sections, namely, locomotive and carriage, traffic department, way and works department, and stationery. The sections are further subdivided when necessary. When material is received it is carefully inspected by examiners as to condition, quality and price. It is then ticketed. The tickets show description of goods, from whom received and price; the latter is in cipher.

CHAPTER VIII.

CARE AND USE OF ROAD MATERIAL.

Much of the material of a railroad lies scattered along its track, away from the observation and care of storekeepers. It is always more or less of an unknown quantity. Its supervision and custody must be intrusted wholly to others; to men having, to them, more important duties to perform. Of this kind of material, that used in the track is the first I will notice.

The supplies required for the repair and maintenance of track are ordered by the various section foremen. These orders are sent to the inspector or roadmaster and by him forwarded to the officer agreed upon, who further passes upon them.

The limited facilities section foremen have for storing material renders it especially desirable to restrict the amount as much as possible. They need enough to meet current wants and extraordinary emergencies. They should, however, not carry over a month's supply, and in many cases their stock may be replenished oftener than this.

Track supplies should be kept, with other material, at a central storehouse, and should be sent from thence to the sections as needed. There is no necessity for a separate supply depot for track or other material.*

The greater the concentration, the less the cost of handling, the greater the intelligence in disbursing, and the less the stock required to be carried.

Undue multiplication of storehouses should be carefully avoided.

Storehouses are required at the various centers where equipment and tools are repaired, but there is no necessity for more than one storehouse or one storekeeper at any particular point. If the storekeeper performs his duties, orders upon him will be filled with the same intelligence and promptness that they would if made upon a subordinate immediately responsible to the person ordering. If he does not so fill them, he is unfit. The remedy lies

* In construction work, or where special gangs are employed, the person in charge should be held responsible for the return to the storehouse of all tools such as tamping and lining bars, etc. The fact that they are in use does not mean that they will be worthless when the work in hand is completed.

in his dismissal or admonition; not in the creation of another storehouse. It is just as proper to have two superintendents for a division, or two master mechanics at a shop, as to have two storekeepers at the same place. If there is more than one storehouse, one storekeeper should take charge of the whole, the others acting in subordination to him. Such concentration will permit the full utilization of the force, and such concert of action in regard to the stock carried as to prevent unnecessary accumulations.

Material forwarded to a track section should be charged thereto, the same as if it were a storehouse. The storekeeper who has general charge of track supplies in the hands of foremen should open an account with each section; the debit to all the sections will make the total amount of material charged against him on the general books.

Foremen of sections should acknowledge the receipt of material and make returns the same as other storekeepers; their returns should exhibit the amount received, amount used, for what purpose and amount on hand. Such a system of returns is easy to maintain. It renders a thorough supervision of track supplies possible.

The disposition of those in charge of track to order more material than is needed is not greater than in other departments of the service. Nevertheless, economy will be increased by careful scrutiny of requisitions and returns.

The exigencies of the track department require that each section should be supplied with such tools and supplies as are necessary to meet ordinary and extraordinary emergencies; common repairs and renewals, and the exigencies of storms and accidents. This necessitates certain flexibility not necessary elsewhere. But the disposition to exaggerate, without knowing it, the wants that these special emergencies give rise to, will be apparent and must be met by attentive and careful oversight.

Track material requires to be constantly looked after. Tools and supplies of all kinds must be so guarded as to prevent loss, misappropriation or damage. Old material, except rails, should be collected daily and stored in some convenient and safe place.

More or less loss is suffered, in the majority of instances, because of lack of storage facilities. In some cases no provision whatever is made. In others, proper use is not made of the facilities provided. Care is not taken to store new material, and old material, instead of being collected, lies scattered along the line. Economy and efficiency require that wherever storage facilities are lacking, the evil should be corrected so far as possible, and where they are provided, that due use should be made of them.

It is not necessary to refer to the inspection of track material here. It requires the services of experts, and in order to enforce responsibility on the part of sellers, much of the material must be watched long after it is put in the track. "The inspection of track materials is important; angle bars, by reason of worn rolls, will come in such shape that they cannot be fitted to the rail; rails will be defective; track bolts will fall short of the required length, and split bolts will have only the semblance of a split and will, consequently, be unfit for use. Track material needs a good deal of careful watching if a company expects to get what it pays for and receive what it wants."*

To simplify the ordering of material by track foremen, they should be supplied with a printed list of the articles they use, so that all they need do will be to enter the quantity opposite the article. The point to be aimed at in track accounts is to reduce the clerical labor of section foremen to the minimum. This can be done by using printed forms.

Many of the conditions that attach to the custody and use of track material apply to supplies for bridges, culverts, fences, and buildings.

They are so widely scattered as to render it exceedingly difficult for the storekeeper to locate their whereabouts or ascertain the uses to which they are put. He is aided in this by returns from foremen and others.

His labors will be facilitated by opening a separate account with each lot of material located along the line. This will require that he should have almost as many accounts on his books as the storekeeper in charge of the track supplies of a division.

The returns rendered him by foremen, while not as accurate as could be wished, will afford him the information he requires, and if lacking will give him a hint of what is going on, so that he may make disposition accordingly.

Among other embarrassments, he will experience one common to every department of the service, namely, difficulty in securing accurate information of the disposition of material left over after the completion of work in progress. This is a most prolific source of error in railway accounting.

Material ordered for the construction or repair of structures is always in excess of the amount needed. The amount of the surplus and its disposition the storekeeper must know in order to keep his books accurately. But his necessities will not be regarded by those who carry on the work; and unless he is constant and minute in his inquiries, the information will escape him. The omission may not involve actual loss to a company, but it will involve irregularity in accounting, and

* Writer on track inspection.

invites extravagance and irresponsible practices. Moreover, if not reported, one account will be debited with more than it should, and another will be charged with less than it should, if no greater harm ensues. This is an evil in itself, as responsibility cannot be enforced where cost is unknown.

The difficulty of protecting supplies used in connection with buildings, bridges and similar structures is too apparent to need reference here. The utmost protection possible to afford is more or less imperfect. However, care will be more likely to be exercised if the facts are kept before the eyes of those responsible; if an accurate account is kept of each lot or article of material scattered along the line, no matter where located or how trifling its value or importance. It will serve as a constant reminder, and will prevent material being overlooked or forgotten. This is about all the storekeeper can do. He should require frequent returns from foremen and others of each lot of material, giving location, condition, quantity, value, proposed use, etc.

CHAPTER IX.

TRACK ACCOUNTS AND RETURNS.

In reference to the Material and Labor Accounts and Returns of section foremen and others having to do with the track, it is to be said that there are no accounts or returns connected with railroads so difficult to formulate satisfactorily as these. Not that the men in charge lack knowledge of their work or laudable desire to please—to perform their whole duty to the company and to themselves—but because they have not the clerical skill nor the facilities for performing such duties. They have no offices, no desks, often not even pen and ink. Nor is their inclination along such lines. The consequence is, if they have elaborate reports to make—as is the case on some roads—they must go to the station agent for clerical help; or, in many cases, the foreman must get his wife or sons and daughters to aid him. The writing and figuring is complicated and delicate and he has neither the acquirements nor the time to spare.

It results from these difficulties that surround the situation, that oftentimes there is practically no effort made by railroads to secure accurate returns in regard to track labor or material. This because the railroads in question do not believe it practicable to keep trustworthy accounts of track work or the different articles of material that the section foreman handles from day to day and month to month—including material and scrap received, used, shipped away and on hand. The result is the companies practically charge the material direct to the various operating, construction and other accounts as fast as it is sent to the section.

And of the labor performed, little or no subdivision is attempted; the whole being charged to particular accounts in gross.

Such imperfect and extravagant methods are, of course, objectionable because the outlay for labor is great, and the value of the material in the hands of section foremen enormous. So great as to require that it should be accurately accounted for, and should not be charged to construction or operation except as it is actually accounted for; any more than material in the general storehouse, or other outlays of a company should be charged without knowing the facts.

And in the case of labor, what each man has been doing from day to day should be shown, for in no other way can intelligent account be kept of cost.

The difficulty is to devise a system of Forms for section foremen for handling labor and material accounts that is within their clerical facilities; that will yet give—in the case of material—an accurate account of supplies received, acquired, on hand, shipped and used (and for what used); that will afford the accounting officers at headquarters sufficient information for compiling their accounts and writing up the books. These records and forms must be so easily understood that any foreman who reads and writes can understand them and fill them up properly and easily; they must also be so thorough that they will take up the material in its appropriate place without omission, or confusing or intermingling distinct accounts; they must be so conclusive that those at headquarters (including the operating officials) will be able to ascertain the particulars of each account, and such other information in regard to supplies acquired (no matter how), on hand, shipped and used as is necessary to a clear understanding of the situation.

Thus, if a section foreman orders material, the official whose duty it is to pass upon the same, must be able to determine from the returns on file—made by the section foreman—whether he needs such material or not; whether he has not material that can be made to answer the purpose required. And, if not, whether other section foremen have not a surplus that can be diverted to cover the requisition in question. And so in regard to unused material and scrap on hand; the record of such material must be so full and explicit that those supervising the work at headquarters will be able to know from each section foreman's return whether he is keeping his section free from the accumulation of scrap and other surplus and unneeded material.

And in reference to material charged to various accounts, the return must be specific, item by item, so that each disbursement can be properly scrutinized and accounted for.

All these things, to be satisfactorily accomplished, require accuracy in the returns, and to secure that, the clerical work of the foreman must be of the simplest nature.

Now, how can forms be devised and arranged so as to do this; so as to enable the section foreman to sit down in his tool-house and write up the returns accurately, intelligently and fully? To meet this requirement (so absolutely necessary in connection with track accounts) more or less effort has been exercised on every railroad. But yet without accomplishing fully what is needed without going outside of the section foremen; without seeking clerical assistance elsewhere.

Either no returns of a substantial nature have been required by railroads of section foremen; or, going to the other extreme, the returns have been made so elaborate that a clerk must be kept, or outside aid sought to write them up from day to day or month to month.

To meet the practical requirements of the situation (requirements that the vast cost of track expenditure justifies and imperatively demands) something at once simple, full and comprehensive is needed. And it is this requirement that the forms illustrated in this volume are intended in a measure to supply.* They are so easily understood and so simple, that a section foreman can fill them up without difficulty, with a lead pencil; and this in so short a period of time each day as not to interfere perceptibly with his other and more important duties. And what is desirable (for writing up the books) they will afford the accountants at headquarters and elsewhere the information they require in order to prepare the necessary entries for the general ledger and other records, viz.: the value of material on hand and the cost of material and labor expended, and to what it should be charged, etc. Moreover, those interested will be able to ascertain from the returns just what articles of material are on hand, new, usable, or scrap, and their value. It will also be seen from the returns what material the section foreman received during the month, so that he may be charged therewith; what he has acquired in the way of accumulated scrap or otherwise, on his own section or from abroad, so that he may be charged with the value thereof. Also what he has sent to other sections, storehouses or elsewhere.

In fact, these forms are designed to afford every species of information that is necessary to enable officials at headquarters to keep track of the material on the various divisions of a road. The blanks are to the point, avoiding every species of work that can be saved the foreman, and yet embodying the information needed at headquarters, the whole compiled in so simple and direct a form that the section foreman cannot go astray.

The object sought is to require of the section foreman only essential things, and leave it to the accounting officials and others at headquarters to finish the record and figure the cost and other details for entry on the books of a company.

It is to be remembered in this connection that if section foremen could be provided with desks and writing facilities, and possess sufficient clerical ability to compile the returns fully, it would be an extravagant waste to require such work of them, for their place is on the line of the road with their men, just as the place of the conductor is on his train.

* Appendix C and Form 41, Appendix D.

In reference to the articles of material inserted in the returns given—they are merely conventional. Each company can insert such articles as its particular need demands.

In regard to handling the labor accounts for work performed by section foremen and others, there has been great difficulty experienced, not only in accurately ascertaining how much time each man works, but the class of work he has been engaged upon. The form of the track time book very clearly shows both.* It has been in use many years, but has been amended from time to time, as experience and new things suggested improvement. The main point in connection with it — as in the case of material — is that every section foreman can keep the account of work performed, and what it was performed on, with ease and little labor, leaving it to the accountants at headquarters to determine the cost and sum up the total.

By reference to this time book it will be seen that the labor of section men can be apportioned to all the various operating, construction and other accounts that come within the compass of their duties and this with such facility that any section foreman can perform the clerical work accurately, and with so little time that it will take nothing practically from his daily duties. Thus, when the day is over, he will enter opposite the name of each man the total number of hours he has worked, and opposite that, under appropriate columns provided therefor, how many hours are chargeable to each of the various operating, construction or other accounts upon which the man has been engaged. Nothing could be more simple or more comprehensive.

In this way the same easy and yet comprehensive method of accounting is accomplished in connection with labor that is provided elsewhere herein for keeping account of material. There is nothing for the section foremen to do, in either case, except to note the quantities in the places provided. Or, if there are exceptions, they are slight and unimportant.

In regard to the track time book, it will be noticed that it affords the data necessary for making the pay-roll at headquarters and writing up the books; just as the material returns afford the data required there for writing up the records and general books of a company.

In addition to the material and labor returns that section foremen must make, other returns that the exigencies of the service require from them are also shown elsewhere herein

* Form 41, Appendix D.

for the information of those interested in such matters. These returns are intended to utilize the knowledge of section foremen in the current operations of a road.

Of the need and great value to a railway company of accurate statistics showing the comparative cost per mile of track for material and labor on different divisions and subdivisions there can be no manner of doubt. In furtherance of this, so far as labor is concerned, the table designated "Monthly compilation of expenditures for track labor, for the information of operating officers," has been prepared especially to meet this requirement.* By turning to it the reader will be able to understand its purpose more clearly than I can explain it here. Its greatest value, however, is in this, that it shows the relative cost per mile — and otherwise — for such subdivisions of a road as the management thereof may elect. Indeed, the cost on each section may be shown side by side if it is desired to be minute. From the information thus gleaned the management is able to see who operates his section, subdivision, or division with the least outlay, and wherein the economy is exercised—a thing all important.

Statistics of a comparative nature, along the same lines, are useful in connection with track material; and more especially the tools and appliances used. Such statistics should show the number of tools and appliances of each kind used on each section or division, and the average expenditure in this direction per mile of road on each section or division.

* Form 83, Appendix D.

CHAPTER X.

INSPECTION, CARE AND USE OF OILS AND SIMILAR SUPPLIES.

The losses railway companies have suffered from neglect to provide adequate facilities for handling material have nowhere been so marked as in connection with the use of oils. Wherever facilities are inadequate, the loss is constant and out of all proportion to the cost of correction. This fact is as apparent to the passer-by as it is to experts. The losses railroad companies have suffered in this direction would afford a large dividend on their share capital.

In nothing was the inefficiency of civil engineers and managers so conspicuous in the early history of railroads as in their neglect to provide storage and other facilities for oils, paints and kindred supplies.

The practice of allowing oil to stand in barrels in the open air until used was general. About these receptacles the earth was sodden, while the air was laden with offensive odors. Annual losses were greater than the total cost of providing permanent, ample and secure accommodation would have been. The neglect arose partly from the fact that railroads did not originally contemplate the use of oils in the shape and to the extent that they subsequently employed them. Absence of provision in the first instance led to neglect to provide for it after the want was known. Conditions have, however, changed somewhat in this respect. Wherever neglect to provide facilities still exists, it is either an oversight or the matter is held in abeyance, awaiting other developments. Nevertheless the waste is going on and is as much a loss as if the company interested were to take gold out of its vaults and throw it into the sea.

Facilities should be provided for oils that will prevent leakage or evaporation. Where justifiable, a separate fire-proof building should be provided for storing. Tanks in which oil is kept should be situated so that they may be easily and quickly filled and the risk from exposure reduced. If the quantity used does not justify a large reservoir, small tanks conveniently located in the storehouse or in an adjoining apartment may be used.

Oil should be unloaded without delay. If facilities are lack-

ing and it must be stored in barrels, they should be kept moist, especially those containing kerosene.

Under no circumstances should oil be left in barrels exposed to the sun. The most meager accommodation is better than this, and the small expense that a rude shed involves cannot excuse neglect to provide it.

Where facilities are inadequate, the supply of oil should be reduced to the minimum; where adequate, it is probable a month's supply at least may be kept on hand to advantage.

The cost of oil is great or small, relatively, according to the intelligence and care exercised, first, in buying; second, in storing; third, in disbursing, and fourth, in using. Much careful thought has been given the last. However, notwithstanding this, the ties and roadbed of many lines are black with the oil that has been spilled from overloaded journal boxes, or because of careless handling.

The saving that may be effected by the economical use of oils for lubricating and lighting is much greater than would be supposed. It requires constant and intelligent effort. It will be found advantageous in this connection to reward those who are provident and admonish those who are not.

Those who use oils are required to be conscientious. They must possess experience and good judgment. If reckless or lacking in discretion, they will use them in excess lest mishap occur. They will use a quart when a pint would do, for fear of the possibility of a journal becoming heated. The happy mean is the least quantity that will answer the purpose without risk.

The lack of uniformity in the quantity of oil necessary to be used upon different machines (generally alike or of identical pattern) is well known to practical machinists; improper alignment, defective bearings and inferior quality of metal increase the consumption of oil. These differences lessen the value of statements exhibiting the comparative use of oils by machines performing the same kind of work, and require to be kept constantly in mind.

The superior utility of high priced oils makes them universal favorites. The determining factor, however, all things considered, should be cost. Ease in handling, or convenience and cleanliness, while important factors, should be held subordinate to this.

That kind of oil which, all things considered, is the cheapest, is the kind that should be used.

In disbursing oils for use on locomotives, the amount should not generally exceed the requirements of a round trip. Stations should be restricted to a month's supply; local depots for lubricating cars, supply trains, etc., to immediate needs, not exceeding a month's supply in any case.

The less the stock of oil carried (without transgressing the limits of safety) the more economical its use and the less the waste.

Frequent and limited disbursements also enable the storekeeper to scrutinize use much more carefully than he otherwise would. Oils are not so likely to be used to kindle fires and for other extravagant purposes under such circumstances.

The economical use of oils should be encouraged in every way. This is one of the objects of locomotive statistics. Among other valuable information, they give the consumption per mile run, and while this is dependent upon the weather, the load and the engine, still they afford generally a valuable indication of the relative economy exercised.* Saving may be further encouraged by daily or monthly bulletins showing those who are careful and those who are not. Comparisons of this nature should be published promptly, otherwise they lose their interest.†

In order to make such exhibits, it is necessary that account should be kept of the oil each employe receives. Upon some roads tickets are used for this purpose; different tickets being provided for different quantities and kinds of oil. When a supply of oil is furnished, a ticket representing the quantity is left with the storekeeper; this affords the basis for his charge. Another system is to use printed slips upon which the different kinds of oil, tallow, waste and kindred supplies are printed in order. The quantity that the person receives is entered on this slip opposite the kind delivered him.

Foremen should be required to approve requisitions for oil. It will tend to prevent extravagance and wastefulness. They know better than the storekeeper the needs of the service, and if they perform their duty intelligently, instead of perfunctorily, their supervision will prove highly beneficial. Such approval is not possible (and perhaps not necessary) with engineers, and may be dispensed with. The slips for ordering oil, referred to, are also adaptable for use at stations and elsewhere.

The best manner of supplying stations and buildings with oil is an interesting question. It is sometimes furnished in cans sent backward and forward as occasion requires. The loss entailed through destruction of the cans and the spilling of the oil is constant and unavoidable. A feasible substitute for this plan is much to be desired. One method is to ship the oil in a supply car, which is run over the road once a month, filling the cans at the different points directly from the tanks

* The compilation of exhibits and statistics along this line is treated of at length in the volume of this series relating to Motive Power.

† These records should be registered from month to month, and form a part of each engineer's permanent record.

in the car. The plan is practicable and economical. It saves the expense of handling and transporting cans backward and forward, also the loss of oils in transit, and other incidental expenses.

The storage of oil should be carefully looked after. No combustible material should be placed near it, and danger from fire should be carefully guarded against.

The person immediately in charge of the oil supply, in common with others who handle such material, should be subject to the direction of the storekeeper. It should be the duty of such employes to fill the lamps, lanterns, torches, etc., and attend generally to disbursements.

The proper inspection of oils cannot be explained here. It requires thorough acquaintanceship with the nature of oils and the best methods of testing. In some cases primary tests are conclusive; in others they are not. Thus kerosene may be accurately tested, while valve, car and engine oils must be submitted to actual use to determine quality. The observation and experience of the men who use the oils must be systematically sought, practical experience being, here as elsewhere, superior to theoretical demonstration or speculative knowledge. A practical storekeeper, speaking of the manufacture of oils and their inspection, says:

"Many things must be considered. Thus, the quality of lard oil must be determined by chemical analysis; it is only in this way that we can detect when it contains cotton seed oil, or is made from the fat of hogs that have died of disease, or from overcrowding; its burning quality depends upon its being made from the fat of healthy hogs killed for use; machine oils must be tested by actual use and analysis, the evidence of those who use them being necessary to determine their quality. Oils used by us, except car and engine oils, come in barrels. Car and engine oils come in tank cars. Car oil is not to be distinguished from engine oil except by its fluidity, the color, weight and appearance being the same. On the receipt of kerosene oil, a sample is taken and tested in the following manner: We heat the oil in an open cup over a spirit lamp, the bulb of the thermometer being submerged in the oil; after a space of about forty minutes a lighted taper is passed over the oil to ascertain the flashing point, and again afterward, at a higher degree of temperature, to ascertain at what degree it will burn. If it ignites at a lower degree than it should, the shipment is returned; we consider kerosene good only when it will stand the fire test at 150 and 175 degrees. Seal oil must stand the test at 300 degrees. We draw our car and engine oil from the tank cars into large vats under the oil house, and pump it from thence by stationary engines into tanks above, from which barrels and cans are filled for shipment to shops,

storehouses, stations and elsewhere, as needed. We manufacture our signal oil from lard oil and kerosene or mineral seal oil. I do not know that it is cheaper, but we are more fully assured of the quality when we make it ourselves. We have recently adopted the practice of manufacturing our own valve or cylinder oil; whether it is more economical to manufacture than to purchase, I do not yet feel certain, but we are better assured of its quality; it is manufactured from tallow oil or lard oil, with an equal amount of oil called cylinder stock The latter is the last product of the retort in refining crude petroleum. Tallow oil and lard oil are the liquid product of crude tallow and leaf lard respectively, pressed at a cold temperature; valve oil is made by placing the two in a tank and thoroughly mixing and heating them to a certain degree of temperature by means of steam coils placed inside of the tank. In making signal oil for winter use, lard oil and kerosene are used; in making it for summer use, lard oil and mineral seal (at 300 degrees test) are used."

Great progress has been made in the preparation of lubricants for railroads. The process of manufacture has assumed the importance of an industry, and employs extended laboratories and an army of laborers, instructors and inspectors.*

In addition to the chemical tests of oil, various mechanical devices have been invented for determining comparative excellence. While these devices measure the amount of friction and wear and tear, they are far from satisfactory, results obtained varying greatly under apparently similar circumstances. Thus in a series of experiments, ten thousand revolutions were obtained in one case, while in another sixty-four thousand were obtained with the same lubricant, the friction, temperature and speed being apparently the same. "Practical differences of durability of lubricants depend not on any differences of inherent ability to resist being 'worn out' by rubbing, but upon the rate at which they flow through and away from the bearing surfaces. The conditions which control this flow are so delicate in their influence that all attempts thus far made to measure durability of lubricants may be said to have failed to make distinctions of lubricating value having any practical significance."†

* The instructors are engaged in explaining the best method of using lubricants, while the inspectors are occupied in seeing that the instructions are carried out, as quite as much depends on the proper use of oils as on their quality. Careful statistics are also kept of results; of the average mileage of journals and such other data as may be necessary to enable railroad companies to determine the kind of oil, all things considered, that is the most economical for them to use.

† Professor Denton.

In further reference to storage houses for oil for local use, inexpensive buildings or separate rooms are sufficient, a raised shelf or platform being provided on which the barrels may be placed and tapped when tanks are not provided. If large tanks are used, provision should be made for hoisting the barrels to the top to be emptied. Tin receptacles should be used for catching the drippings from faucets. Oil storage houses for large stocks should be fireproof, one story and basement, the tanks being placed on the lower floor. The second floor should be on a level with the floor of the car. Thus a barrel may be rolled directly over the tank and readily emptied. Light oil shipped in tank cars may be withdrawn with a siphon if necessary. The tanks should be large enough to hold a two weeks' supply of oil. The bottoms of the tanks should be of conical shape, thus permitting the oil to be drawn from faucets at the bottom, and so prevent the accumulation of sediment and reduce the expense of keeping the tanks clean. The piping at the bottom of the tanks may be arranged so as to bring the faucets within a short distance of one another, thus economizing in labor in drawing oil. The second story of the storage building may be utilized for storing oil in barrels, tallow, waste and kindred supplies.

Subsidiary oil houses should be placed in the yards for the convenience of oilers and others.

In cold weather oils must be heated, so that they will run freely. In small houses a carefully guarded stove may be used for this purpose. Steam heat is, however, better and safer, the coils being placed according to the degree of heat required.

Every precaution should be observed to guard against fire. Oil houses should be kept clean. Open lights should not be allowed. The lighting should be done by electricity, or if that is impracticable, by carefully guarded stationary lamps.

CHAPTER XI.

INSPECTION, CARE AND USE OF BRASSES, BABBIT METAL, AND SIMILAR MATERIAL.

The great value of brass and the general market that exists for it add to the difficulty of protecting it. In shipping from one point to another it is necessary to lock and seal the cars or otherwise surround the material with especial safeguards. Brass in store must be guarded as carefully as silver. The danger of loss is constant and imminent, not so much from employes as from others.

Methods, at once varied and ingenious, have been adopted to prevent the loss or careless handling of brass and similar material; aside from the rule requiring it to be carefully guarded, the rule that those who make requisitions for such material shall return the worn-out or broken articles, has been the most effective. It is very simple. But it makes everyone particular. Thus, when an accident occurs, the person in charge collects every article that has to be replaced. Without it he is sure to experience more or less trouble in replenishing his stock. Its possession facilitates the exchange; renders his task easy.

This system of exchanges is a constant reminder to engineers, car repairers and others that in order to replenish their stock they must preserve worn-out and broken articles; must not allow them to be lost or carried off. Such exchanges are constantly going on.

An account should be opened with each person to whom a brass is given, charging him with the number. When the article is returned worn out or broken, a new one is given in exchange. The original charge need not be disturbed. When, however, a person leaves the service, the account should be closed.

In the event the supply in the possession of an employe is lost or diminished, the books should be changed accordingly. The English companies are very strict; if satisfactory account cannot be given of a missing article, its custodian is held responsible, the value being deducted from his wages. This is generally fair and cannot prove a hardship, while its enforcement will prevent many irregularities and losses.

Brasses in the hands of workmen should be inventoried

monthly, or oftener, when those having them in charge leave the service.

It is impossible to prevent occasional loss of a brass, but the circumstances attending the loss can be explained. The interests of the service require that this explanation should be promptly forthcoming in every instance.

In addition to orders for brasses and kindred articles to replace those worn out or broken, there will be a demand for such supplies to form new stock; original orders, in fact. In such cases there is, of course, no old material to give up. The storekeeper should satisfy himself that the order is necessary and equitable. If the issue is for construction purposes, or immediate use, the charge should be made accordingly. If it is to be held in reserve, it should be charged to the person holding it.

The number of different forms of brass castings that a railway company uses is much larger than would be commonly supposed. The care of patterns and the protection of the material before and after manufacture require ample provision. Wherever possible, a separate room should be provided. When the supply does not justify this, a secure cupboard or other inclosure should be used.

It should be remembered, in this connection, that it is oftentimes more important to protect the raw material or scrap than the manufactured article. This is so when the latter has a mark or a stamp upon it by which it may be identified. However, guardianship must in all cases be incessant and intelligent.

In distributing brasses, the rule observed in the case of other material, that the supply shall not exceed actual needs, should be rigidly enforced.

Not only must articles in store and in use be carefully looked after, but all equipment passing to and from other roads must be inspected at the time of transfer, and articles worn out, damaged or missing properly noted and return made thereof. The importance of this examination has suggested to the car department of railways the necessity of co-operating in the work and of having it carried on systematically by skilled inspectors.

In reference to forms of accounting, they should be such as to render the work easy, simple and thorough. The blank for ordering articles should have printed thereon the different kinds used. It should contain a column for entering the number on hand; also the number returned. If an article has been lost, there should be a place for explaining the loss. If an employe is responsible for the loss, the English companies, as already pointed out, require that he should pay the value of the article. Orders for brasses should specify the purpose

for which they are to be used, and in the event they are not thus used, immediate notice of the fact should be given the proper official.

The loss of brasses, babbit metal and similar articles suggests others entirely different. Take the item of stationery, for instance. Everywhere employes use the stationery of their employers as their own. The universality of the practice excuses and justifies it. It has its counterbalancing considerations. The practice is more common with the employes of private individuals than with those of corporations. The use of the paper, envelopes and stationery of the employer is recognized as a perquisite of the employe. Abstractly considered, the practice is indefensible. As a matter of fact, the employer does not suffer at all, or only in a minute sense. The use of his stationery advertises him, while it assists those under him to eke out a slender income. So long as it is thus restricted, no harm is done. In all other things, however, the property of employers should be scrupulously respected. When it is not, the act is indefensible; this is especially the case if the appropriation is for purposes of gain.

The benefits that employes derive from the concessions and courtesies of employers are much more general and valuable than is commonly supposed. They are none the less valuable because the employer does not always suffer from them. Thus, the passes given employes are of enormous value to them, while the loss to the company is very small, if it suffers any loss at all.

In the majority of cases those who use the passes would not travel without them, and in other cases the employer is recouped by the increased loyalty of his servants, and by their ability to work for less wages. I might greatly extend the list of mutual benefits. It is, however, unnecessary. I refer to the subject simply to illustrate the beneficent relations that exist between employer and employe, and the general disposition of the former to aid the latter.

CHAPTER XII.

COLLECTION, CARE AND UTILITY OF OLD MATERIAL.

There are two classes of old material; that which has no value except to the junk dealer, commonly called scrap, and that which may, with slight repairs, be used again.

In the hurry of business more or less material that might be used again finds its way to the scrap heap.

Old material should be examined, first at the place where it is collected and afterward at the general depot. This double inspection will prevent material being sold that may be used again.*

It is probable there is as little waste on a railroad as elsewhere. But there will always be such instances. It does not matter whether it arises from ignorance, thoughtlessness or indifference; the monetary loss is the same. Instances, while not common, are frequent. Thus, switch chains, frogs, bolts, injectors, cylinders, cocks and similar implements that might be used again, are thrown aside as worthless. In order to prevent the losses their sale would involve, it is necessary that old material should be inspected by men capable of determining that which is usable from that which is not; and who, moreover, will call the attention of officials to persistent cases of neglect.

After usable material has been separated from the other, the latter must be assorted according to its value. This is very important. Iron, steel and brass, for instance, must be kept separate and classified according to value. To mix the different kinds and classes is to lessen their value.

The promptness and thoroughness with which old material is collected, assorted and stored is an evidence of efficiency.

Neglect breeds demoralization, besides the direct losses it engenders. It is frequently excusable, because of other and more urgent duties. It is a question of values. For a busy man to leave his work and go out of his way to collect old material of less value that is in no immediate danger of loss or misappropriation, is not economy. But if risk may be avoided by placing convenient receptacles for old material

* "Any person putting material upon the scrap heap which is otherwise valuable, or carelessly wasting material in any other way, will be punished as the case may deserve."—*Extract from Rules of English Road.*

about the various buildings and along the track of a railroad, where it may be deposited by men otherwise occupied, then, undoubtedly, neglect to do so is inexcusable. The work of removing the material from such receptacles is not important. It may be carried on at such time and in such manner as may be most convenient. Wherever provision of this nature is neglected, the loss of old material will be constant. It will be covered up with cinders, dirt, weeds, brush and grass; will be hidden away behind buildings and under platforms and stairways, or stolen by the thieves that lurk about every railroad yard.*

The old material that accumulates about particular stations, offices or buildings is oftentimes so small as hardly to merit attention. It possesses, however, in the aggregate, an enormous value and its care merits the same attention as other matters.

Another class of old material should be noticed, namely, the papers and books that accumulate about the stations and offices of the company. They are of sufficient value to make them worthy of attention.

The separation of the papers and books that it is desirable to retain from those which may be sold requires to be conducted with the greatest care. The work must be performed by those experienced in such matters, and able to distinguish at a glance that which may be safely disposed of from that which must be kept. The assortment of papers must, in the majority of cases, be made at the place where the papers have accumulated. No rule can be laid down except, perhaps, in reference to traffic papers and books at stations.

The great bulk of papers at the headquarters of a company must be kept, practically, forever. They may not, indeed, be necessary to protect the company, but no one can tell when they may be necessary to protect the good name of some officer or employe.

In regard to accumulations at stations and local offices, it is a good rule to require that no book or paper shall be disposed of except under the direction of the authorized officers and inspectors of a company.

Traffic papers must be retained until the expiration of the period of limitation fixed by statute. This period varies in different states, and in order to cover interstate business the records must be retained for the longest period of time which the statute of limitation covers in any particular state.

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* "Each foreman should be responsible for collecting any coupling chains, hooks, pins, iron, or other material which may be found on the line, and for having them conveyed to the nearest station weekly." —*Extract from Rules of English Road.*

When no claim against the carrier for loss, damage, overcharge, or other purpose, as represented on such papers and records, can be prosecuted, they may be sold.

It should be the duty of inspectors and traveling auditors, when visiting places where old records and papers accumulate, to personally superintend the waybilling and shipment of the same to the sales agent or general storeroom. The waste paper that accumulates about offices should be preserved and shipped with the records, as stated above; or if it is inconvenient to retain it until such time, it may be shipped separately.*

Old material should not be sold, except under the direction of an authorized officer. The necessity of limiting this power is manifest. Such sales are commercial transactions and require commercial skill and knowledge. They should be governed by the markets of the country and with due reference to transporting from one point to another, including cost of handling. In this way material will be disposed of in the place where it accumulates, if it can be sold there to advantage, thus saving the company the risk and cost of transportation and rehandling. The seller must possess a general knowledge of markets in order to get the highest price. Only those who make a specialty of such knowledge possess it.

When old material is shipped directly to a rolling mill, or elsewhere off the line, without weighing, the agent of the company on the ground or at some intermediate point should weigh the same and certify the weight to the storekeeper making the shipment; also to the proper officer of the company. At the close of each month, moreover, such agent should make a report to the officials named of all cars thus weighed, specifying the date, number, kind of scrap, consignee, weight, and such other particulars as are necessary to enable the company to keep accurate and full account of the same.

Much of the old material that accumulates cannot be identified. This will be so in regard to the filings, drillings and borings that accumulate about a shop. It has been suggested that a good way to dispose of such amounts is to place them to the credit of a general account, and apportion them afterward to the different maintenance accounts (with which the shop keeps account) on the basis that the amount expended on such accounts bears to the total amount of material expended. Thus (if it is a locomotive shop), the credits would be apportioned to the various locomotives according to the total amount charged to them during the month. The same

* I think it would be a good plan for every company to have a central storehouse, conveniently arranged, for keeping their old books, records and papers until such time as they may be sold.

rule should be followed in regard to cars and machinery. If it is a shop where all kind of work is done, the apportionment must be general, to the extent that work is general. Whenever the amount of accumulated old material justifies it, a division may be made on the basis of particular classes of material; thus, credits for old cast iron would be based on the amount of charges for cast iron; credits for old car wheels on the new wheels used; old wrought iron on the wrought iron charged, and so on. By devices of this kind each storekeeper will, according to his intelligence and interest, be able to arrive at an accurate disposition of the credits that arise from old material.

CHAPTER XIII.

COLLECTION OF SURPLUS MATERIAL, INCLUDING TOOLS AND MISCELLANEOUS ARTICLES.—THE AUDITOR OF MATERIAL AND LABOR, AND HIS DUTIES.

The effective supervision of stores of railway supplies (including tools) along the line of road naturally suggests itself in connection with the subjects treated of in the foregoing chapter. More particularly, however, that feature relating to surplus material and implements that accumulate on a road and that need constant and special attention. Against the surplus on one section there will be found more often than otherwise a lack of needed material and tools on another section. One does not, however, offset the other. Wherever a deficiency exists the foreman or person in charge, it is probable (unless under great restraint), will continue to call for what he needs until he gets it. In the case of a surplus, however, it may be allowed to accumulate and so remain a long time without effective effort being made to dispose of it. It is not in the way, and it may be needed sooner or later. Moreover, the foreman—or person in charge—is busy and the pressure on him to send in the surplus is spasmodic. Nevertheless, he would give the subject more attention if he had more leisure. But his every hour is crowded to the full with important work. So that oftentimes nothing is done with scrap and surplus articles. What is the remedy for this? To issue a circular calling on everyone to send in his surplus? That would be an easy way if it accomplished the purpose; but it would not do this, except in part. Everybody is busy, and circulars are soon forgotten. Moreover, the collection of the surplus requires a searching examination. About everything has been tried to remedy the evil—and failed. It is a business in itself and the only way it can be accomplished is to send an auditor over the line. Not in a private car or on a freight train, but on a hand or motor-car in company with the superintendent or roadmaster. In this way he will overhaul every building and tool-house, not forgetting to look behind each; scrutinizing every nook and corner, every foot of track and right of way; note every bit of scrap, every item

of material, every tool, every implement, every piece of furniture.

Having in this way ascertained the surplus on the line, he will report the same to the general storekeeper, who will take immediate measures to have it sent to the storehouse most convenient for its sale or distribution when needed. Or, if any surplus article is withheld he will find out the reason therefor and insist upon compliance. It may not be easy in every case to get the surplus shipped. For the working forces of a road cannot always get supplies and tools promptly as they need them, and so hold on with honest tenacity to any surplus they may have—this against a rainy day—against the times they will need the things they are asked to part with. So that it requires not only tact, but considerable energy and perseverance to secure the transmission of the surplus once it has been located. But its shipment should be insisted upon rigorously; even if there is some doubt as to its advisability. If this last is done we may hope that, in the course of time, particular pains will be exercised to send off any unneeded articles; and when this is not done that the futility of attempting to hold possession of the surplus after its discovery (coupled with the censure that attaches to the act), will lead everyone to act promptly and effectively in the emergency. Thus the duties of the auditor will be much simplified and the expense and worry of the general storekeeper's office be much lessened.*

In this way an efficient service will be slowly built up; and if the auditor of material and labor continues diligent in his work, it will be maintained thereafter with little difficulty, to the great and lasting good of the railroad interested.

I have referred above to the fact that while there may be a surplus at one point there may be a deficiency somewhere else. Thus, to illustrate, one section will be short of tools while another will have a surplus. The question has suggested itself more than once whether or not, in such cases, the surplus should not first be used to supply the deficiency, instead of its being sent to the storehouse. Thus, if a shovel is lacking on one section, while there is a surplus on another, would it not be good practice to have the deficiency supplied directly from this excess? Such disposition would, in any event, depend largely on the experience and good judgment of the auditor. On the whole, however, it seems best—as a practice—though exception might sometimes be made—to or-

* In this connection it is presupposed that the auditor, in his search for surplus material and tools, will take into consideration contemplated work as well as that being done at the moment of his examination.

der the surplus to headquarters and let those immediately responsible for filling requisitions judge as to the need of supplying the deficiency. Deficiencies in supplies and tools, as claimed, may be real or may not; only a competent person can tell. If the auditor is such a person no harm can be done in leaving him to supply deficiencies from the surplus. Such direct measure would be economical as it would save one handling. Whatever the arrangement may be it should be wisely considered with the view to what is most economical and effective from the standpoint of a company.

In the way I have described, either by shipping all surplus to the storehouses or by using it so far as need be to supply deficiencies along the line, supplies and tools will be utilized to the fullest extent and extravagance and loss prevented. For every dollar's worth of surplus material; every unnecessary article—be it a lamp, stove, spade, or other thing of value, no matter what—is just so much unproductive capital. Not only that, but such property is in peculiar danger of being overlooked and forgotten, and so injured through exposure or neglect, or—in the case of light articles—stolen by the tramps that infest the lines and yards of railroads. Not being needed daily the surplus is not carefully looked after. I introduced the practice of employing special auditors to travel constantly to gather up the scrap and surplus articles. It was an experiment. But experience soon demonstrated its great value. For it at once became apparent that while no one purposely ordered more material than he needed, or kept back property—scrap, surplus articles, tools and material—intentionally, yet such was the case. It was found that those who used such things, being actively engaged in practical work, failed, in many cases, to take cognizance of the surplus and so let it lie. By sending a sharp-eyed man, of good judgment, over the road to take note of everything in and about the yards, buildings, storehouses and track, it became possible to locate the surplus and afterwards secure its shipment to the storehouses to be sold or added to the supplies in stock. Success in such methods will become easier each month, as it will be possible to secure more active co-operation upon the part of those interested. At first the practice may be looked upon as an interference; a questionable innovation, and excite in consequence considerable doubt.

In the progress of his work of inspection the auditor should make a record of the material and articles no longer in use, that may be spared. In order to determine the latter, considerable care and circumspection will be necessary. Thus, in passing over a piece of road, to give an instance, he must note the condition of the fences in order to determine whether

the amount of fence wire or lumber on hand is such as circumstances require. To cite a case in point illustrating the necessity of this; in one instance the auditor in going over a line, noted, as was his practice, the condition of the fences. Afterwards, figuring up the supply of wire on hand, to cover repairs, he discovered (and this was a great surprise to the storekeeper in charge) that there was enough wire on hand to build the fence anew. In other words, there was many times as much surplus material held to meet emergencies as was needed. A cursory examination would not have developed this; but the expert, having nothing on his mind save the auditing of the supplies along the road, and being skilled in his business, quickly detected the surplus.

Reference to the articles used by section men, named in the accompanying forms, for keeping account of material and tools used in repairing roadway and track, renewals of rails, renewals of ties, repairs of fences, road-crossings, signs and cattle-guards,* will illustrate the vast amount of material, and the great number of tools used in connection with work of this kind; supplies not only great in number and extent, but of immense value. This material (to say nothing of the vast amount in store at supply depots and elsewhere), scattered along a road and often in excess of needs, and in many cases without adequate facilities for storing, abundantly emphasizes the necessity of the auditor's work and the need that it should be continuous and painstaking.

The accumulation of surplus material, as I have intimated, will not be confined to any particular branch of the service. Wherever there is portable property; tools used, utensils, or a stock of material, there is likely to be scrap, if not a surplus in other directions. So that as the auditor traverses the line his duties will require him to look everywhere. The track is only a part of the whole. He will need to overhaul the paraphernalia as well as material of those who have to do with general stores; station and train supplies; tools and other things used in connection with bridges, buildings, fences, telegraph and other structures; the signal service, the interlocking plants, offices, baggage rooms, etc., etc. He will, in fact, need to scrutinize every nook and corner where there is material, tools or property of any description. In the most unlikely places he will find something to be collected and sent to the depots of supply to be kept for use or sold, as the case may be. Such accumulations are unavoidable. Those in charge see the surplus articles, it may be, every day; and yet do not see them. The property is not in the way and very likely petty. Anyway it is overlooked. This is not strange.

* Appendix C.

These men's minds are intent upon their particular business. Indeed it may be that, if their attention is directed to it, its value and importance appear not worth the labor of handling. So it is left. Yet, in the aggregate, the property that thus accumulates, when collected for a whole road, amounts to an immense supply in itself, and of great value and practical utility. For every article has a use or may be sold. But no one appreciates what these infinitesimal and widely scattered articles mean except the auditor and general storekeeper.

In connection with his other duties it will naturally fall to the auditor of material and labor to see that due diligence and care are exercised to protect the portable or personal property of a company—material, tools, utensils—both in use and not in use. Not that those in immediate charge will not be found faithful and diligent; but because this expert will effectively supplement their labors; for, as already stated, he has nothing on his mind except to attend to matters of this nature. With all others it is a mere incident and a very small one.

In order to make the greatest possible use of the auditor or inspector* he should be required not only to scrutinize the material and portable property, in use and not in use, along the line, but he should be required, so far as may be practicable, to ascertain by personal inspection on the ground, as to the care and intelligence exercised everywhere in keeping the time and making the pay rolls of those who work for the company. To note whether the time is kept systematically from hour to hour and day to day, or whether it is written up in gross at the end of the week or month—everyone being allowed the maximum sum. By such inspection an additional and valuable check will be secured on this great and widely scattered expenditure. Not only should the auditor assure himself, so far as he is able, that accuracy in keeping the time of employes is observed and in making the pay rolls, but also that the time is apportioned to the thing upon which the labor was expended. For it is not enough that the wages of men should be accurately kept; the management must know on what kind of work the men were engaged, so that the cost thereof may be determined. This is true of every department of the service.

If carelessness, inefficiency, or something worse is discovered in keeping the time of men, or in distributing it, the auditor will have it corrected, and this to the betterment of discipline if not actual saving in money.

By adding these duties to the others the value of the auditor's efficiency may be greatly increased.

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* A good title for this official is "Auditor of Material and Labor."

From the foregoing it will be seen that the watchfulness and skill of the auditor of material and labor will throw a much needed safeguard around many important expenditures. And, to recapitulate, he should see that all surplus material (all portable property, such as material, tools, furniture, fixtures, etc., etc.) in storehouses and along the line of the road is reported to the general storekeeper, that the latter may direct its shipment to the storehouses of the company; that all material—portable property—in use and not in use, is carefully looked after and, so far as practicable, guarded from loss or damage; and finally that the time of employes is properly kept and the accounts upon which the labor is expended, duly charged.

From all this it is apparent that the auditor of material and labor may be made one of the most valuable means the accounting officer—or whoever is in charge—has of exercising needed supervision over the vast disbursement accounts of a company for labor and supplies of every description.

CHAPTER XIV.

ACQUISITION, CUSTODY, PRESERVATION AND USE OF TOOLS.

Railways require to exercise care in guarding their tools and hardware. Every company loses more or less of such articles. They are coveted by some because of the price they will bring; by others for their use simply. The latter is the more frequent occasion of loss. Indeed, the number who purloin to sell is so small as to hardly merit attention.

Tools of common use, such as saws, hammers, files, hatchets, also lamps, are so convenient about a house that they offer constant temptation to the unthinking. To buy would be a hardship, perhaps an impossibility. Moreover, acquisition without purchase enhances the satisfaction of ownership; makes the thing doubly valuable. Such is the perversity of human nature. Many articles of hardware are also taken for like reasons.

There is something very attractive about new tools and hardware to a mechanical man. They possess a glossy, cheerful look, that suggests many uses. The sight of them creates a desire to own. They are to him what a piano, or clock, or vase is to a town lady; an assortment of choice household utensils to her rural sister. But what is singular is that the taker does not associate the idea of stealing or wrong-doing with the act of taking. The personality of the owner is so vague that he is entirely forgotten; his rights not considered.

Indeed, the distinction between owner and employe is often lost sight of by those who work for corporations. Not that the latter are dishonest; they are not. But the spades, axes and shovels that lie scattered here and there seem to have no owner; seem to be quite as much the property of one man as another, except that they have much less relative value to the owner than to those who work for him.

What more natural, then, than that the shining implements the thrifty householder needs should sometimes be borrowed by him and that their return should sometimes be overlooked and finally forgotten? Such practices are not general. On the contrary, they are exceptional, and those who indulge in them (small as the number is) would be horror stricken if told they were committing a crime. The act is

not criminal except when committed by criminals. It is the result of thoughtlessness growing out of the neglect of the owner to properly guard his property. It is, however, none the less to be discouraged. The losses it engenders, while they do not seem to affect anybody, really affect the fortunes of individual people, as real and bona fide as the employe himself. The indefensible acts of the few necessitate rules and regulations governing the many. Such is the origin of the law. It holds in check the upright and strong, as well as the vicious and thoughtless. The same is true of the rules and regulations of railroads, more particularly those looking to the protection of property.

Strict rules are necessary to prevent the loss of tools, or their abandonment, while still serviceable.

Many tools, that might still be used with a little repair, will be cast away if care is not exercised. Improvidence will also characterize their use. I have heard it stated (whether truthfully or not I do not know) that the wear and tear of a company's tools in the hands of mechanics amounted to fifty per cent. per annum, while in those cases where the tools were owned by the operatives themselves, it was not over twenty-five per cent.*

The propensity to appropriate or ill use property belonging to others must always be guarded against. A means of guarding the supplies of corporations in the hands of employes is to restrict disbursements to actual needs.

The disposition of employes to order more than is needed, and to fail to properly guard the surplus, is natural and unavoidable.

It is difficult to build up economical habits in employes.

It is easy to build up extravagant habits in employes; the latter are aggravated by loose methods of government.

Frequent changes of managers are demoralizing. They breed uncertainty. One official will enforce the most careful economy in the use of tools; another will not give the matter any consideration at all.

Rules and regulations should be uniform and consistent—such as not to harm anyone honestly desirous of fulfilling his obligations, but sufficiently strict to reach the thoughtless, the improvident and vicious, taking hold of the latter, indeed, with iron hand. The English railroads are very strict in this respect, and much more methodical in their measures of gov-

* On the other hand, as a set-off against this apparent loss, it is stated that where employes use their own tools the result is not satisfactory. To use the words of my informant: "There is a question as to the advisability of employes using their own tools; they will work with them just as long as possible, and the consequence is that they will not do good work, and will take too much time for that which they do."

ernment than we are. Some of their regulations will be found embodied further on in this chapter. Many of them sound very queerly to us; they have a smack of frankness and good sense about them that is refreshing to Americans, who durst not, for their lives, call a thing by its old-fashioned Saxon name, if it refers in any way to the populace, more especially the voters, who, in our lofty sentimentalism, we agree in designating by the euphonious title of "wage workers."* If the wage worker, however, be a man who has accumulated a little money, a few shares of stock, by his industry and saving habits, the case is different. In such event it is fashionable to call him a thief, monopolist, gold bug, speculator, a grinder of the faces of the poor, and so on. If we want a vote, this will help to get it, and none of us knows when we may want a vote. We all of us have a weather eye for the offices, and a soft side for the voter! We are very tender of him in the aggregate; very neglectful of him individually.

In giving out tools, an account should be opened with each employe, charging him with those he receives and crediting him with those he returns or accounts for.

No tool should be given out, except in exchange for an old one; save when an original stock is created. Those who have tools should be required to return them before getting new ones. This rule is so simple that anyone may understand it, and so comprehensive that its observance will protect a company from carelessness and theft. Of course there will be exceptions to the rule. Articles will be lost or stolen without anybody being to blame. In such cases it would manifestly be unjust to compel the employe to make them good. Exceptions, must, therefore, be made. But the utmost thoroughness and frankness should be observed in scrutinizing losses and in looking after property in the hands of employes. This will not injure anyone, and will benefit all.

No specific rule can be laid down for guarding articles in the hands of employes. It must be such as circumstances require. Thus, rules that are practicable for implements used by mechanics about a shop would not answer for those used by train, station and road men.

Where a storehouse is in immediate proximity to a shop, it should be made the receptacle for storing tools at night or when not in use. In other cases, different provision must be made, but it should be of the same general nature.

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* When I worked upon a farm, I labored; was called a *Laborer*, was a *Laborer*. Since then, however, the word has apparently become offensive, as we no longer hear it. Under similar circumstances I should doubtless now be called an "Industrial Agent," "Soil Cultivator," or "Wage Worker."

The more simple and economical the method of keeping a record of the tools in the hands of employes, if it accomplishes the purpose, the better. It has no value except for the moment. It does not invite elaborate bookkeeping.

When tools are delivered for use away from the storehouse, a receipt should be taken and a special charge made against the employe. A duplicate of the receipt should be kept by him, so that he may always have a record of the article charged against him. A very good way to treat such accounts is that observed by banks with their bills receivable account. Thus, when a charge is made, the credit line opposite is left blank until required to offset the debit. The blank lines on the credit side always show the number of bills unpaid. With charges for tools, the number of blank lines opposite the charges would represent tools outstanding in the hands of workmen, and a casual glance would inform the storekeeper of the status of each account.*

The tools and devices of a company should, so far as practicable, be stamped with its name. Articles in the hands of employes should bear their private mark.

In order that due responsibility may be enforced on the different lines of a road, a record of the tools used must, under certain circumstances, be kept by a particular storekeeper; all other storekeepers must report to him. If a trainman can procure tools at different storehouses, the charges therefor should be summed up by the general storekeeper and the recipient held responsible for the aggregate number he receives. To enable this to be done, each storekeeper must report to the central storekeeper daily the articles he delivers. If an old article is returned in exchange, the fact must also be reported, so that credit may be given. This concentration of accounts is unnecessary, except in the case of employes who procure tools at two or more storehouses. When they are supplied by a particular storekeeper, such storekeeper can exercise the supervision that the central storekeeper exercises in the other case.

Not only should old tools be returned before new ones are issued, but the rule should apply to other articles, such as paint brushes, brooms, lanterns, feather dusters, pails, switch chains, jackscrews, wheelbarrows, crowbars, etc. It should apply to every article which, when no longer needed, may be returned as evidence that it has not been misappropriated or lost through neglect or otherwise. The list comprises an enormous number of articles of small value; superficially, a record of them will appear unnecessary and extravagant. But this

* The form of return described in this connection with the distribution and use of station and train supplies is, perhaps, superior to this method.

looks only to the act, and not to the effect; considers only the value of particular articles (which is not great), rather than the aggregate value, which is enormous.

Orders for tools (except when old tools are exchanged for new ones) should be approved by an official conversant with the needs of the person making the order. This duty requires experience, firmness and tact.

If tools cannot be delivered to the storekeeper at night, as described, secure boxes should be furnished in which to keep them. The rule should be to place it within the power of every employe to protect the property intrusted to him, so that if loss occurs, the presumption will be that it is because of neglect.

An inventory should be taken at frequent intervals of all tools in the hands of employes.

When an employe leaves the service, or has no further use for tools, they should be delivered up or accounted for before paying him his wages.

An inventory of articles in the hands of employes will serve to discover any not needed. If articles are found not charged, it will indicate lack of efficiency in disbursing or accounting. The inventory will also call attention to the condition of property in the hands of employes; the care they exercise, etc. It emphasizes the necessity of guardianship.

Tools used on locomotives should be issued by storekeepers on orders from foremen. So far as practicable, enginemen should get their supplies and tools from one place. For example, an engineer running between Boston and Albany should procure what he needs from the Boston shop, getting at the Albany shop only such tools as are indispensable for his trip to Boston. The master mechanic can regulate the furnishing of tools to enginemen by instructing them where to procure what they need, and by giving the foremen at different shops instructions as to what runs they shall supply. In this manner the different foremen can keep posted and will know if an engineman is careful in the handling of his tools or not.* Engineers, as a rule, are careful. They like to feel sure when they start out that they are not going to run short of anything, and as they do not like the trouble of going over their stock at the commencement of each trip, they keep their tools under lock and key.

A plan for keeping account of locomotive supplies, that has been attempted, is worthy of notice. It has been found to work very successfully. It is this: Engineers are furnished a record book, in which the articles used on locomotives are

* If the rule required that all tools disbursed should be reported to a central shop, this requirement would be more easily enforced than in the manner stated here.

printed in alphabetical order. When supplies are required, this book, with the necessary order for supplies, is presented to the storekeeper, who enters therein the quantity furnished and the date. At the close of the month the engineer signs and dates the record and sends it to the master mechanic, in this way furnishing a statement of supplies issued to him during the month. Excessive orders, if any, are noted by the master mechanic and the value of the supplies issued and the average cost per mile run during the month ascertained. Engineers working under similar conditions are grouped together and a statement compiled showing the cost of supplies furnished each, the number of miles run and average cost per mile, which is posted monthly. The result of each engineer's work for the month is made a part of his personal record, and is taken into consideration when men are to be advanced to more desirable positions. It is believed that this practice results in a more economical use of supplies. The engineers are thrown into more active competition with each other, and by carefully grouping those running under similar conditions, a fair comparison can be had.

Orders for tools for use on trains should be made on the storekeeper by the conductor, but should not be filled by the storekeeper until approved by the superintendent or some authorized person.* Trainmen are inclined to be careless with tools, if all that is necessary to obtain new ones is to make an order on the storekeeper. But if the order must bear the scrutiny of the superintendent, they will be more careful.

The storekeeper should be empowered to refuse to fill an order if he sees anything out of the way. For instance, if he should know that a conductor had recently had a number of tools similar to those called for by an order, he would be justified in referring the requisition back to the superintendent for further consideration. As a rule, an order that a storekeeper would not fill would never be taken back to the superintendent. Tools on trains, unless carefully looked after and guarded by the crew, are very liable to be stolen. The most effective way to make a crew take care of their tools is to hold them responsible.

The distribution and care of tools is more or less complicated under the most favorable circumstances. No two persons will agree, it is probable, as to the best method. The plan I have outlined, however, is both efficient and economical. An experienced railroad man, referring to the subject, says: "A new system ought to be instituted for the delivery of tools and supplies. I would supply each engine, way car,

* Except in the case of the exchange of new tools for old.

coach, section foreman—in fact, every person and everything —with a complete outfit. Every article to be stamped with the name, as 'Coach 95,' 'Engine 236,' 'Section 5,' and so on. I would make the person immediately in charge responsible, and when a new article was wanted, would let him understand that the old one must be returned or a satisfactory explanation given. Every day, lanterns, wrenches and hammers are lost or stolen, or some mishap of a like nature befalls, which would not happen to one's own property. To start such a system would cause trouble and annoyance, but when once established would more than pay for itself in the saving effected. Many of the houses in this frontier town have lanterns that belong to the railroad company, which have no right there, and no doubt numerous other articles which cannot be identified have found their way to private houses in the same manner."

The enforcement of the rule requiring the return of the old article before issuing a new one will prevent the depredations he refers to. He exaggerates the difficulty of adopting the system. All that is required is that an inventory shall be taken of the articles in the hands of employes, and that the same shall be specifically charged to them.

The system should not be restricted to tools, but should be applied to articles of every kind, lanterns, brooms, axes, etc.

When tools are shipped away, a receipt should be returned by the receiver, so that the sender may be sure that the property has reached its destination.

In sending tools back and forth for repairs, no formality is necessary, except such as may be needed to insure their reaching their destination quickly. Many devices are employed for this purpose. Sometimes the property is waybilled; in other cases it is checked like baggage; again a tag is attached. It depends on the nature of the material. A good plan for a single article shipped by baggage car is to attach a metal check with the address of both sender and receiver; thus, the token may be used in both directions and for many times.

More or less care is required to be exercised to prevent loss of tools in passing back and forth. My attention has been called to a device for track tools that is highly recommended for its simplicity and effectiveness: "Each section foreman is provided with a strong iron ring, made so that it can be bolted together; to this ring is attached a copper tag stamped with the number of section and name of station. The section foreman strings his tools on this ring when he desires them to be repaired and sends them to the shop. A small attachment enables him to send his wrenches on the

ring. For crowbars a strong brass band, stamped in the same manner, is provided. This is a much better way than sending the tools tied together with string." The same person suggests a rack fixed upon springs in which to ship lamps and lamp globes back and forth on the line without the labor of packing or risk of breaking. The devices for shipping implements and tools would fill a chapter.

The methods enforced by the English companies for insuring faithfulness and care in the use of tools are very sweeping. I cannot do better than embody the most pertinent here. They are worthy of careful study. They are as follows:

"Every mechanic must be provided with such tools as are usual in his trade, and his chest will be examined by the foreman when the workman leaves the service. Every man will be required to see that each of his shop tools bears the initials of the company and his own private mark. Every man borrowing tools from another must be careful to return them immediately they are done with. A list of each man's tools will be kept. When any workman requires a new tool, he must apply to his foreman for it, who, if it be necessary, will either supply it or give instructions for it to be made. All new tools must be given to the men requiring them by their foreman, who will receive those they are intended to replace, and no tools must be made or obtained without such authority. Any man using taps, dies, rimers, gauges or templates must see that when done with, they are immediately returned in the same condition as when received to the person appointed to take charge of them. His not calling the attention of that person to any defects or damage at the time he receives them, will be considered a sufficient proof that they were then in good order; and if any of them should be lost, the man to whom they were delivered will be held responsible. Private tools are not allowed to be made in the shops, under penalty of instant dismissal. Any man on leaving the service of the company will not be paid his wages until he has delivered up to his foreman the key of his drawer or tool chest, and the quantity of tools charged against him, to the satisfaction of the person authorized to receive the same.

"A lock and key will be supplied to each man's tool box and drawer, in the first instance, which must be kept in a proper state of repair afterward by the person to whom it is given up. Any person losing the key of such lock must replace it at his own expense; and any man breaking open another man's drawer, box or lock of any kind will subject himself to dismissal. No workman will be allowed to take out of the works any tools or materials, unless they are specified

by his foreman upon the pass, and the number of pieces stated. All passes must be left with the gatekeeper, who is required to take an account of all material of any kind which passes from the works through his gate. All tools and implements required for the repair of the line must, when not in use, be kept locked up in a building, or in boxes, for the security of which each foreman or ganger on his own length of line is responsible. When a man leaves the service he must immediately deliver up his uniform and all other articles belonging to the company. Any money that may be due for wages to any man leaving the service will not be paid until the clothing, book of rules, lamps, flags, tools, detonators, and all other articles the property of the company, which may have been supplied to him, shall have been delivered up. If not delivered up, or if any article be missing or damaged by improper use, the cost of such article or the repair of such damage shall be a debt due from the man to the company, and may be deducted from any pay then due, and if such pay be found insufficient to meet the claim, will become a debt recoverable at law. As regards the engineering department, the tools used by platelayers are in charge of the various way inspectors, and must be replaced, when required, in accordance with instructions. Stock must be taken at the end of each half year, when each ganger must give an account of the tools in use on his length, which report must be certified to by the permanent way inspector and sent to the storekeeper. With respect to tools supplied to workmen employed in the permanent way shops, each workman is provided with a drawer or cupboard, with lock and key; the drawer and key must be numbered, and all the tools used by the man to whom the drawer or cupboard is appropriated must be marked with the same number and stamped with the name of the company. The man will be held responsible for all such tools, and in case of loss, the amount will be deducted from his wages. With regard to the locomotive department, each man engaged in the working of engines, etc., receives a proper equipment of tools, and is held responsible for the care and custody of the same. When an engine is sent into the shops for repairs, the driver must hand in the tools, etc., and if they are found to be complete and in good order a receipt will be given by which he can claim the tools when the engine is again ready for work. If any irregularity is discovered, the case will be dealt with by fine or otherwise. The regulations in force in connection with the tools supplied to workmen employed in the locomotive shops are similar to those which apply in the shops belonging to the engineering department. Permanent way materials are supplied through the chief storekeeper. As soon

as they are delivered on the ground, they are in charge of the permanent way inspector of the length where delivered. Each inspector is charged from the divisional office with the material supplied to him. He is also credited with all that is used, a daily record of which must be kept by the gangers under him, and sent to the divisional office fortnightly. Stock of all material must be taken every six months, and by comparing the stock on hand with the amount charged, the slightest difference will be detected, if any, in each inspector's stock. In the case of small stores, they must be kept in the small stores depots, of which there are three on each division, and requisitions for daily consumption, as required, must be sent by the inspector to the storekeeper. Stock must be taken of these small stores every six months, and the amount on hand checked with the book balances. With respect to tools supplied to workmen, they must be supplied by the storekeeper upon an order from the inspector. Stock must be taken of all tools every six months, so that it may be ascertained if any are not accounted for. Workmen must make good any tools intrusted to them which they may lose."

CHAPTER XV.

KINDS OF FUEL: THEIR UTILITY, ACQUISITION, CARE AND USE.*

[NOTE.—In railway phraseology material is designated separately from fuel. However, when I speak of material or supplies I also include fuel.]

The deterioration of wood commences as soon as it is seasoned after being cut. Each day thereafter detracts something from its heat producing qualities. The process of decay is not the same with all woods. Moreover, it is great or small according as they are exposed to the elements or not.

Coal has greater heating capacity than wood. Alexander Watt says that the heat disengaged during consumption is double that of wood. He does not, however, tell us the quality of coal used in making his tests or the kind of wood. Without this information, his figures are more interesting than valuable.

The rapid and general use of coal for locomotives has made the value of wood as a fuel largely speculative in most localities. However, some roads still use wood.

In Mexico, the hardy, scraggy mesquite is used where it can be procured. It is also better for ties than any other wood in that country.

Some of the roads operating in the great timber districts of the United States still use wood for fuel. The cost per cord delivered on the track is very low. But to this must be added the expense of sawing, transferring, piling, etc.

Valuable woods for heating purposes are hard maple, hickory, beech, hemlock, ash, oak, and so on.

Maple may be used to advantage before being entirely seasoned.

The resin in hemlock makes it a desirable fuel.

Hickory is one of the best of woods, but unfortunately is rare.

Desirable wood can be procured only in limited quantities. It is necessary to eke out the supply with inferior qualities.

Some woods are so affected by moisture that a heavy dew renders them unfit for use until they have had time to dry.

Certain kinds of wood dry so slowly that, when corded, the

* The use of oil for fuel is treated of in another volume of this series.

outer layers decay before the interior of the pile is seasoned.

Swamp elm will not cure at all.

Many kinds of wood have little more heating capacity than paper, and are thrown aside by firemen, as is the slate found in coal.

The substitution of coal for wood, while it has not reduced cost in every case, has much simplified the question of fuel supply, rendering it possible for the bulk of our railway companies to procure what they require from day to day. They need only keep on hand over and above current wants, such supply as is necessary to meet the contingencies of blockades, strikes, delays, and other accidents of business. The amount will vary. Some companies find it advantageous to lay in a winter's supply in advance; others a more limited amount. Practices are not uniform.

Where wood is used, a large supply must be kept on hand, as the cost of cutting and hauling is much cheaper at one season of the year than another, while a considerable time is required to season it for use.

All kinds of bituminous coal commence to deteriorate in heat-producing qualities as soon as mined. The loss varies according to quality and climate. If properly protected, depreciation is generally slow; in some cases merely nominal for a considerable period.

Coal contains more or less moisture. It is not absorbed from the atmosphere, but is inherent.

Some kinds of coal are so damp when taken from the ground as to be unfit for use until dried.

In high altitudes, where the weather is warm and dry, the disintegration of bituminous coal is so rapid as to destroy its value within a few weeks after being mined. Throughout the greater part of the United States and Europe, however, disintegration is comparatively slow. In fact, the length of time soft coal may be preserved depends largely upon the care taken to protect it.

When the mass is sufficiently great to preserve the interior from atmospheric action, the deterioration is still less.

If bituminous coal is left exposed to storms, the deterioration is immediate and rapid, multiplying in intensity with the lapse of time. A gentleman thoroughly familiar with its use writes me as follows:

"Opinions differ in regard to the depreciation of bituminous coal, even among those who handle it daily, and when called upon to state the percentage of depreciation, the most surprising differences are noticed. Much depends upon the weather. If in midwinter the air is dry and steadily cold, the loss will not be so great as it would be if there were light snow or rain with occasional sunshine. In summer, rain and sunshine accelerate destruction. I was inclined at first to say

that the loss of coal for one month, if properly sheltered, would be nothing during the summer season. This is not true, however. There is a loss sustained, even during so short a period, not so much from atmospheric depreciation, however, as from handling. It is first thrown from the cars into the stock shed. If the shed is one-half full or more, it must then be thrown to the back side of the shed. When needed for use, it must be shoveled into a bucket before being thrown into the tender. Under this handling the coal rapidly disintegrates, and the result is that more or less of it crumbles into dust. I place the depreciation of bituminous coal at eleven per cent. for six months when exposed, and at eight per cent. when not exposed. Recently, in cleaning up a coal shed, I found the loss to be as stated. The coal was badly slacked, and when used went through the fire box and flues like so much chaff. The harder an engine is worked, the more difficult it is to keep the slacked coal (dust) in the fire box. In many cases it does not ignite at all, or ignites as it is passing through the smokestack, or even after it has left the latter. The heating capacity of such fuel is merely nominal under the most favorable circumstances."*

As he states, the ratio of depreciation is a subject of dispute. No two agree. I am inclined to think that he under, rather than over, estimates the loss. However, his experience and observation make his estimate of value. If the table could be continued, it would be found that depreciation was much more rapid after six months than before.

When we consider the relation that cost of fuel bears to total cost of operating a railroad, the importance of the loss from depreciation becomes manifest. It is a constant reminder to the officials of railroads of the necessity of keeping

* He submits a table in which he estimates the weather waste of bituminous coal at Chicago as follows:

TIME.	SUMMER.		WINTER.	
	EXPOSED.	UNDER COVER.	EXPOSED.	UNDER COVER.
One month.	Two per cent.	Very little.	Three or Four per cent.	None.
Two months.	Three and a half per cent.	Two per cent.	Four and a half per cent.	Very little.
Three "	Four and a half per cent.	Three and a half per cent.	Five and a half per cent.	Two and a half per cent.
Four "	Six " "	Five per cent.	Six and a half per cent.	Four per cent.
Five "	Eight " "	Six and a half per cent.	Seven and a half per cent.	Five " "
Six "	Eleven " "	Eight per cent.	Ten per cent.	Six " "

the supply on hand as small as possible, and of throwing around the stock every possible safeguard.

In reference to the qualities of coal and their condition under different circumstances, the following communication* affords much interesting information:

"In regard to the weathering or depreciation in value of coal after it is mined, there is but a small amount of reliable information. To carry on such an investigation as would yield accurate results requires a great deal of time, and but few chemists have ever undertaken the task. Most of the investigations, the results of which have been published, were carried on by German chemists at the German universities. By the term weathering or weather waste of coal is meant the deterioration in value which coal undergoes when exposed to the air under various circumstances. This deterioration is due to the action of the oxygen of the air upon the carbon and hydrogen of the coal, and also to the decomposition of the impurities of the coal, chiefly iron pyrites, which are always found in greater or less quantity mingled with the coal.

"The composition of bituminous and anthracite coal varies greatly.† When coal is exposed to the air, the chemical changes which take place are as follows: The coal absorbs oxygen from the air. A portion of this oxygen combines with a portion of the carbon of the coal, forming carbonic acid gas; another portion of the oxygen unites with part of the hydrogen, forming water; another portion of the oxygen combines with various organic parts of the coal and the remainder is used by the iron pyrites, and forms oxides of iron and sulphuric acid. This acid at once unites with any lime, clay, etc., which is present, and is soon washed out if the coal is exposed to the weather, but appears as white streaks if the coal is kept under cover. The effect of weathering is to diminish the carbon and hydrogen and increase the oxygen in the coal. The organic or combustible part of the coal is decreased, and the ash or inorganic part is increased. The heating power of the coal, and consequently its value, is thereby diminished, and when the coal contains more than a trace of iron pyrites, disintegration or slacking takes place owing to the fact that the products of the oxidation of the pyrites occupy greater space than did the pyrites, and in a

* From G. M. Davidson, Analytical Chemist (for which I am much indebted).

†

	BITUMINOUS.	ANTHRACITE.
Carbon	75 to 80%	90 to 94%
Hydrogen	5 to 6"	1 to 3"
Nitrogen	1 to 2"	1 to 3"
Oxygen	4 to 10"	1 to 3"
Sulphur	0.4 to 3"	.....
Ash	3 to 10"	3 to 4%

short time the value of the coal is very much diminished. The deterioration of coal due to the action of the oxygen is increased by elevation of temperature, and takes place even when the coal is dry. The deterioration due to the oxidation of pyrites requires the presence of moisture. Hence the greatest deterioration of coal occurs when it is exposed to the action of the weather during the hot months, and the least deterioration when it is under cover during the cold months. Prof. Grundmann, of Tarnowitz, by analyzing coal before and after exposure to all conditions of weather, in a pile of about three hundred tons, found a loss of volatile matter of 58 per cent. in nine months. Another sample of the same coal protected from rain and snow lost 43 per cent. in nine months. Both samples lost their power of coking in two or three months. He found that the decomposition takes place in the middle of the pile the same as on the surface, and that the rate of deterioration reached its maximum about the third or fourth week, and that one-half the total oxygen absorbed was absorbed during the first fourteen days. He also states that coal poor in oxygen absorbs it most rapidly. Coal which he examined when freshly mined and found would make good coke, after exposure either would not coke at all, or made a very poor quality of coke. Prof. Varrentrapp, of Brunswick, found by his investigations that the oxidation of coal takes place rapidly at ordinary temperatures when moisture is present. He found the weather waste in some cases amounted to 33 per cent., and in one instance decreased. 45 per cent. in gas yielding qualities and 47 per cent. in heating power, while the same coal kept under cover lost in the same time 24 per cent. for gas purposes and 12 per cent. for heating purposes. These experiments were made with German bituminous coal. In regard to the weathering of anthracite coal, I find that the general opinion of chemists is that it is but very little if at all affected by exposure to the weather. Lumps of anthracite have been examined which have been exposed to the weather for thirty years and found to be first-class fuel. In regard to the effect of the weather on bituminous coal, nearly all varieties deteriorate to a great extent when exposed to the air. This deterioration is greatly favored by high temperature and, in coals which contain iron pyrites, by moisture. In coals free from iron pyrites this deterioration seems to be as rapid when the coal is dry as when it is wet. It is always increased in all kinds of bituminous coal by increase of temperature, and is more energetic when the coal is in dust or slack, especially when it is accumulated in large heaps which are without ventilation and so retain nearly all the heat which is developed."

The quality of coal from no two mines is alike; nor, indeed, from different parts of the same mine. These differences de-

stroy, to a certain extent, the value of tests made of a particular coal, so far as they apply to other coals.

Differences in the quality of bituminous coal are more marked, probably, than with most other materials. Engineers tell us that coal from a particular district burns easily and uniformly, and is a good steam producer; that another is fair, but not so good; that another contains too much sulphur; that another is lacking in vitality; that another has so much slate as to be worthless; that another is too damp, and so on.

The great value of the practical knowledge that engineers and firemen have of the fuels they use is well known by railway companies, and is taken advantage of to the utmost in buying and using.

Many railway companies make systematic efforts to instruct their enginemen in the scientific use of fuel; in the laws of combustion; in the economical generation of heat; in the effective use of fuel in making steam. They are repaid for their efforts by material reductions in the cost of fuel per unit of service.

Coal is more destructive to the fire box of a locomotive than wood, because of the sulphur and gases it contains. The gas is greater in hard than in soft coal.

The peculiar features that attend the use of different kinds of fuel, and the fact that no two kinds possess the same heating capacity make their use a matter of experience and study. If the adaptability of a fuel is not known, wastage will occur as a matter of course.

When the kind and quality of fuel is the same, differences will arise on account of differences in the ability and disposition of firemen. It is estimated that there is thirty per cent. difference between a good and a poor fireman in the fuel used. It will be seen, therefore, how important it is that a company should have good firemen, should be able to distinguish between good and poor firemen.

Those familiar with such matters assert, and truly, that each engine has peculiarities that must be observed in firing, if efficiency and economy are to be secured. This is impossible, it is manifest, if firemen are constantly changed from one machine to another. Not only will they not possess requisite knowledge of their work, but power to hold them responsible will be lessened, and in many instances totally wanting. Moreover, under such circumstances men will not feel the interest in their work that they would if it were carried on more systematically and with a more intelligent view of increasing their knowledge and sense of attachment.

In order to secure the highest results obtainable in the use of fuel, scrupulous observance of every necessary detail

must be practiced. The fireman must be familiar with the fuel he uses; also the peculiarities of the locomotive he fires.

The performances of firemen should be studied and their efforts compared, not generally and cursorily, but exhaustively and minutely. As this work increases in extent by the growth of a road, there will be a disposition to neglect many details. It must not be forgotten, however, that a company will be the loser thereby.

The multiplication of engineers and firemen upon a railroad should be attended by the multiplication of methods of supervision. Upon a small road the work may be done by the manager or master mechanic, but when the time of these officials is otherwise fully occupied, the duty must be delegated to others and must keep pace with its volume and importance.

More or less of the heat energy of fuel escapes. This must be prevented so far as possible. The economical use of fuel depends on men and machines. A storekeeper whose opportunities of observation are extensive, writes me in regard to the use of fuel, as follows:

"A vast quantity of fuel is wasted through imperfect knowledge of the art of firing. How to teach men to extract the greatest amount of heat from the least amount of fuel, and put in practice such knowledge, is a thing that suggests itself to every railroad manager. I would suggest the appointment of an officer who understands the principles of combustion, and who is endowed, moreover, with the faculty of teaching and influencing others. It should be the sole duty of this man to instruct employes in the use of fuel and oil; to make the work his exclusive study. Not only should men be verbally instructed in the use of fuel, but they should be provided with a concise formula setting forth the principles. These formulas should not only be learned by those who actually perform the work, but by those whose duty it is to employ such men or supervise their work."

In the economy of fuel the engineer plays a part as important as the fireman. His method of using steam economically, feeding the water to his boiler, and so on, have a marked effect on the amount of fuel used. The fireman, to be efficient, must understand the principles of combustion; must appreciate the importance of a proper supply of air to his fires; must be careful not to allow the grates to become choked with cinders and clinkers. So important are these facts that some railroads have adopted a regulation by which half of the saving in fuel effected by the care of the engineer and fireman is divided between them. The amounts thus paid are considerable. Not only are the results arrived at valuable, but an incidental advantage is also secured, namely, the abatement of

the smoke nuisance, which is largely the result of imperfect firing.*

Fuel is the most difficult of all material to care for; its general use by the community makes its possession a matter of common concern. But if it were never stolen except by those actually suffering, its loss would be less aggravating. Unfortunately this is not the case. From the time it leaves the mine until used, it is subject to the depredations of pilferers. It is thrown from the cars while en route, and is surreptitiously taken from the yards, storehouses and locomotive tenders. Nowhere is it safe for a moment except within secure inclosures. These facts are thoroughly understood, but lack of proper facilities for storing renders it impossible to avoid loss in many cases.

When wood was more generally used, the poverty of the companies and the enormous supply required to be kept on hand rendered it impossible to place it within secure houses or yards. Better provision is possible for coal. A certain percentage of loss occurs, however. This loss is sufficient in many, perhaps the majority of cases, to warrant the construction of secure storehouses or the employment of watchmen.

The general disposition evinced to erect secure buildings where only sheds and open yards before existed, is an evidence of the appreciation of the subject by railway companies.

The fuel supply of a railroad should be quite as inaccessible to the public as its other material. The annual expense for maintenance and interest on buildings that this will involve will be slight compared to the losses that will occur where precautions are neglected.

Coal has many advantages over wood besides those I have mentioned. It is, as a rule, cheaper; is not so subject to the danger of fire; is more compact, and simpler to account for.

Wood involves exceptional expenses for inspection, supervision, depreciation, handling, accounting, etc.

The cost of fuel forms a large percentage of the expenses of a railroad. It is increased or lessened according to the intelligence and fidelity exercised in purchasing, caring for and using. Much thought has been given its use. Employes have been stimulated in every way to exercise economy. In many cases rewards are offered for those who show the greatest intelligence and care.

In order to determine the measure of economy exercised by employes, careful comparisons should be made of fuel used on different locomotives for the same month and for the same line and for different lines. Comparisons should also be made of the consumption of the same locomotives for different

* The duties of firemen are more fully referred to in another volume of the "Science of Railways" series relating more particularly to such matters.

months. Similar comparisons should be made for the fuel used at stations, in cars and elsewhere; wherever, in fact, conditions are similar or the zeal of operatives may be increased thereby.

The method of buying and handling fuel varies according to the experience, talent and prejudices of men. Thus, upon some lines it will be handled wholly by operatives; upon others, the work will be done wholly by contract. Both methods have their advocates, and are successful according to the measure of intelligence and energy exercised.

In reference to the custodianship of fuel: that at stations is very generally intrusted to the care of the agent; at shops and elsewhere, to the storekeeper. The supply of fuel that a company must keep in stock will depend upon circumstances. If necessary to lay in a supply ahead, requisitions should be made far in advance, so that provision may be made for buying and shipping to the best advantage. A greater stock of fuel should never be carried than circumstances render necessary. The loss from depreciation, if nothing else, would render such a course the best.

The cost of handling coal and the attendant waste and depreciation from exposure have been greatly reduced by the use of elevated and mechanically operated coal chutes, from which, with the minimum amount of labor and loss of time, the coal is dumped on to the tender of the locomotive. To further lessen waste and reduce the cost of unloading the coal from the car to the chute, the track is elevated to the level of the floor of the shed that covers and protects the chutes.

CHAPTER XVI.

REGULATIONS ATTENDING THE STORAGE AND DISBURSEMENT OF MATERIAL.

Material should be disbursed only on orders properly signed.

Disbursements should take cognizance of the articles, quantity, time, manner and use.

The higher the degree of intelligence and interest evinced by the disbursing agent, the greater the care in ordering and using.

Orders should be filled under the direction of a particular person.

Orders, like bank checks, should be filled up solidly, no blank spaces being left for subsequent additions.

Orders should be delivered before the material is taken from the store. An English rule provides that "any workman desiring material of any description, including deals, planks, battens, timber or scantling, and taking them out of the yard without first making application for them at the office, will be discharged."

Orders should specify the name of the person to whom the material is to be delivered, and, if possible, the name or number of the workman who is to use it. An effort should be made to particularize the transaction; to make all concerned feel the responsibility that attaches to their actions.

Orders should be signed by the foreman and, if possible, countersigned by an official having cognizance of the facts; they should be definite as regards articles and quantity; thus, they should not read for "nails," but should specify the kind and quantity. Such things seem trifling, but they are important, and matters of every-day occurrence.

Orders should specify the use to which material is to be put, and the account to which it is to be charged. This information is necessary for writing up the accounts. It is also necessary to enable the storekeeper to judge of the expediency of an order, as regards quality and quantity.

Orders should be carefully filed and preserved by the storekeeper; they form the basis of his accounts, and justify his action.

In distributing material, that which is oldest or most

likely to decay should be used first; this is especially necessary with lumber, timber, fuel, and similar supplies.

Those having charge of disbursements should be familiar with the stock. They should also be experienced, if possible, in the needs of the service, so that they may not only anticipate its wants, but judge of the interest and care that is exercised by those who order and use material. It is desirable that a particular man should be assigned steadily to this work. If it is not sufficient to give him constant employment, he may be assigned other duties, but this should take precedence over everything else.

The person making disbursements should be skillful. He should not only be familiar with the use of material, but know how to load it into cars, and pack it into boxes and otherwise arrange it. When such work is performed by an inexperienced person, damage is likely to occur from imperfect loading or packing; it is also unnecessarily costly. In loading goods reference should be had to unloading; the total cost should be considered.

Orders for material should be carefully scrutinized by those experienced in such matters. They should be reduced to the minimum in every instance.

When disbursements are in excess of needs, it encourages careless handling and improvident use. When the amount delivered is only sufficient to cover the work in hand, economical use is necessary; if in excess, a margin is left for waste.

The duty of storekeepers, as already intimated, does not end with the filling of the order; with the delivery of the material. Their duties require that they follow it into the workshop; into the hands of the workmen; to see that it is used as stated; to take note of those who use it extravagantly; of those who use it prudently. They must remember, too, that it is as necessary that the latter should be recognized as that the former should be punished. Raw supplies disbursed for use in the manufacture of goods remain especially under the supervision of the storekeeper. It is his duty to look after them; to watch their disposition; to see that they are accurately accounted for.

In shipping supplies, ingenuity must be exercised to do so at the least expense and inconvenience to the company. Thus, if goods, in small quantities, are to be shipped by freight train, they should be taken to the station and waybilled the same as freight; if in car lots, they may be loaded at the storehouse if more convenient.

When material is shipped to local points in small quantities, it should be forwarded as way freight; the impolicy of using a car in such cases is apparent. It is, however, frequently done, because of the fact, probably, that the property belongs to the company.

The prudent use of a company's equipment is all important and must never be lost sight of.

In order to facilitate petty shipments of supplies, storekeepers should provide themselves with suitable boxes and appliances. These they may use over and over again.

Orders for material should not be made greater than necessary to save the labor of frequent shipping. The economical use of material will be better assured if the supply is so small that the person using it is constantly reminded of the scantiness of the store and the necessity of its being carefully husbanded.

The number of storehouses should be restricted as much as possible.

The small supplies used at isolated roundhouses, local car repair stations, and similar places, can be accounted for to the nearest storehouse, and returns to headquarters made therefrom. There is no occasion for establishing petty depots for such material.

Undue disbursements of material prevent accurate knowledge of the amount on hand, and have therefore a tendency to swell the same.

Material is nowhere so safe as when in charge of a storekeeper.

It is the same as money; when received, it should be inspected with care; when in store, it should be watched with vigilance; like intelligence should attend its disbursement.

Neither too much nor too little should be given out. A cashier knows that if he pays money not called for by his voucher, or if he loses the latter or neglects to record it, his cash will not balance. This is also true of the storekeeper, except that in the case of the cashier his balances tally to a cent if proper care is exercised, while in the case of the storekeeper discrepancies are inevitable, because of differences in prices, measurements, averages, etc. But if he exercises care the amount of the discrepancies will be trifling.

In disbursing material the charge should be on the safe side, i. e., it should be enough, but not excessive. A comparison of the inventory at the close of the year with the balance standing to the debit of a storekeeper will (after making allowance for differences in prices, measurement, etc.) afford a very fair indication of the care and intelligence he has exercised.

Every company should if possible, have a general storehouse from which material may be supplied to lesser storehouses as needed. It will also serve as a local depot. Its judicious use will render it possible to reduce the supply of material to the minimum. In the absence of such a depot, the disposition will be general for every storehouse to multiply its necessities. But if the orders of local storekeepers can be

filled at a moment's notice from a central store such storekeepers can be made to restrict their orders to current needs. They will not only have no motive to increase their stores unnecessarily but will be encouraged to decrease them so as to save labor and responsibility.

In reference to the disbursement of supplies for local use at night, or in the absence of the storekeeper, a capable and trustworthy person should be selected to perform this duty. He should be governed by the rules and regulations applicable in other cases. If proper forethought is exercised there will, however, be very little demand for such supplies. But in order to meet unavoidable cases provision must be made. Lubricants and tools for locomotives will be most in demand at such times. A good plan, in the latter case, is to provide a cupboard in the roundhouse in which to keep an assortment of tools for use as required but which may not be disturbed without the return of the old tools, or compliance with the rules governing in the case.

To facilitate the easy shipment of stores, it is desirable that there should be a track on each side of the storehouse, but it is of even greater importance that the floor of the storehouse should be on a level with the floor of the car. One man can, under such circumstances, perform as much labor as two men under other conditions.

CHAPTER XVII.

CARE AND STORAGE OF STATION AND TRAIN SUPPLIES.

Many of the articles furnished employes are of so little value that, considered apart, they do not seem to justify the cost of watching over them, of counting and inspecting, of keeping a record of their disbursement and use.

Nor are the benefits of such watchfulness at first apparent. It is, however, both necessary and valuable. Experience has proven this.

We must take cognizance of every article disbursed. In some cases, notably that of stationery, the value of the article, considered by itself, seems not to justify it. But the aggregate value, coupled with the necessity of supplies being prudently used and carefully guarded, warrants it, even if the spirit of economy it inculcates does not. This is true of the blanks of railways as much as it is of more costly articles.

In distributing articles to replace others, such as water buckets, glasses, dippers, lanterns, brooms, inkstands, erasers, cuspidors and kindred property, the old article should be returned, as required in the case of tools and brasses described elsewhere.

The rule is a valuable and necessary one.

It should be observed wherever the return of the old article will prove that it has not been lost or misappropriated.

The rule of exchanges is a simple, inexpensive and practical one; one that everybody can understand and easily live up to. Its enforcement will ever prove instructive and valuable.

To make the supervision of train and station supplies effective, an account should be opened with each person to whom they are furnished.

Orders for supplies should be scanned to judge of the economy that has characterized the use of preceding disbursements, as well as the propriety of the present request.

An account in dollars and cents need not be opened with each employe, but a record of the articles should be kept. To facilitate comparisons, blanks, instead of books, may be used if thought better. It is not necessary to go into elaborate bookkeeping. The method of keeping the account should be

made subservient to the purpose it is designed to serve, namely, to see that orders are restricted within reasonable limits, and that supplies are carefully husbanded and used. The record is of no value further than this, and the simpler it is, the better.

An employe should not be able to order articles such as we are treating of from more than one storekeeper. Such restriction will simplify supervision and heighten responsibility.

If allowed to order from different storehouses, storekeepers should be required to report their disbursements to a particular official, so that somewhere a full account may be kept of the supply furnished each individual. The same rule, in fact, should be observed as that suggested elsewhere in connection with tools.

Orders for station and office supplies should cover a month's needs.

In the case of stationery, three months' supply may be ordered to advantage, except when the consumption is great.

Orders should be restricted to the amount that can and will be carefully cared for and economically used.

Careful comparisons of supplies consumed should be made.

In the case of fuel, oil and similar supplies, the known needs of the person making the order will guide the storekeeper in making disbursements.

Excesses of every kind should be promptly repressed or investigated.

Reference is made elsewhere to the plan of supplying stations with oil from a supply car sent over the road, with an attendant, monthly. Petty station and office supplies are also distributed from the car (collecting at the same time the old and worn-out articles in exchange), thus completing work quickly, at a slight expense, that otherwise would require days, with attendant losses and wear and tear. In this way much labor and accounting is saved, and by providing racks for lamp chimneys and similar articles, the boxing and packing, necessary when articles are shipped in packages by freight or baggage, is avoided.

The value of articles, tools and other appliances in the hands of agents and conductors is so great as to warrant the designation of a person to look after them. This is especially true of large stations, wrecking trains, and dining and sleeping cars.

In the case of car tools and appliances, the frequent changes among trainmen make it difficult to fix responsibility for property of this nature. It is frequently overlooked or unavoidably left behind in the case of accidents and detentions and is liable at all times to be stolen without anyone being to blame. It is exceedingly difficult to follow the use of train

tools or trace their loss. But reasonable responsibility may be secured by inventorying the supply at the end of each trip. In case of loss, the burden of proof rests on the person in charge. This will compel him to examine the supply turned over to him by his predecessor and to watch it while in his hands. Both of these things are as necessary to the safety of the public as they are to the careful husbanding of a company's property.

The value of careful accounting and a rigid enforcement of the system of exchanges I have described, applies to all classes of appliances; to the cooking utensils, crockery, silverware, napery, and other appurtenances of dining cars; to the food, cigars and liquor with which they are stocked; to the blankets, linen, toilet articles and other appliances for sleeping, drawing room and business cars; to the tools and accessories of wrecking cars; to the fuel, oil, stationery, trucks, and tools in use about stations; to the implements in the hands of trackmen; to the axes, saws, hammers, coal buckets and lanterns of passenger and baggage cars; to the switch ropes, jackscrews, wrenches and other implements of caboose cars; to hammers, files, chisels, oil cans, packing hooks and other articles of locomotives; to the tools of carpenters and machinists; to every kind of portable property, in fact, in the hands of employes. The number of articles would fill a volume.

I shall not attempt to describe minutely methods of accounting. I design simply to lay down the principles that should govern and indicate generally their method of application. However, it must not be forgotten that methods must adapt themselves to cases. Thus, a system of returns that will prevent loss or misappropriation of tools in the hands of machinists would require considerable elaboration to encompass the needs of dining cars, where the utensils are much greater in number, value and general adaptability.

CHAPTER XVIII.

ARRANGEMENT OF SUPPLY DEPOTS, INCLUDING YARDS FOR CONSTRUCTION MATERIAL.

[NOTE.—Many of the suggestions contained in this chapter are applicable to common storehouses and yards, and, in so far as this is so, should govern.]

The facilities a construction supply depot will require will depend upon the amount of material to be handled and the length of time the depot is to be used. If it is temporary, and the quantity of material small, the facilities may be simple and inexpensive.

In many things depots for construction supplies are the same as those for handling operating material. The regulations governing the latter are also, generally, applicable to them.

In arranging a depot for construction material, the office and storeroom for small supplies should be located so that the work may be generally overlooked by the storekeeper in charge.

As the storehouse and office will be only temporary, they should be constructed with that view, and with the least possible damage to the material used in its construction.

In arranging tracks for distributing material, the upper end of the first siding may be used for storing material for buildings; further on for rails; still further on for track fixtures, arranged and classified, with a view to being loaded on the cars with the rails. The second side track should be used for ties; this track, and those beyond, if the amount of material to be handled is small, need only be connected with the main track at one end; when the space between the first and second siding is filled with ties, the track may be crowded over and another rank laid, and so on. Afterward, as fast as a rank is loaded and shipped, the track may be crowded toward the center again, and thus the material may be reloaded without the necessity of being carried far.

Each kind of tie should be kept separate.

Switch material, including frogs, stands, rods and headblocks, should, so far as possible, be kept together for use simultaneously.

Rails, for convenience and economy, may be piled on racks made of ties; the foundation must be solid and level.

If the amount of bridge material is not large, it may be stored at the lower end of the first siding, where it can be put in shape for use before leaving the yard.

In storing material, different dimensions, sizes and kinds should be assorted and piled by themselves; thus, boards or rails of unequal length, or timbers of different dimensions, or ties intended for different purposes or locations, should not be piled together, but so separated that each may be conveniently reached when needed.

If sidings incline slightly in the direction cars are to go after being loaded, it will facilitate moving them without the aid of locomotives and cheapen cost of handling.

If the depot is located at a point where sidings are not sufficient for switching empty and loaded cars, it will be necessary to make special provision; in such case, a track may be laid parallel with the main track and between it and the first siding.

In shipping such material as ties, rails, switches and track fixtures, the exact quantity required may be determined, unaided, by the storekeeper in advance. Material for bridges and buildings, however, will require specific orders in each instance as regards kind and quantity, otherwise waste will ensue; my attention has been called to an effective means of handling this material: the engineer in charge furnishes the storekeeper with a list of the material required for particular kinds of structures; with this he deposits a sketch of each kind and class of structure, showing it when completed; when he requires material, he designates the diagram of the structure wanted. This plan enables the storekeeper to fill the order without error or waste, and consequently at the minimum cost; to send timber of the right length and dimensions, and in the right quantity; boards of the right kind and amount, and so on; each structure is, in fact, shipped complete, supplies tallying exactly with the wants of the builder.*

Orders for material should be addressed to the storekeeper. He should also be furnished with copies of requisitions when made; should know when supplies will be needed; the probable time of their receipt, and so on. He must also know whether they are to be unloaded in the yard or sent to the front as received. He must, in fact, with the engineer, understand all the details connected with the material to be used, so that he may make needed arrangements in advance.

The necessity for forethought and energy on the part of a

* The reader is referred to the chapter in this book on the classification of construction accounts; also to the volume of this series on constructing and maintaining railways, for details in regard to construction not embodied herein.

storekeeper is very great. He must insure the arrival of material in due season and prevent its being received and shipped to the front without inspection and entry on his books.

He must see that material is unloaded with a view to economy in handling; that in loading, due thought is given to the easy and rapid movement of material at the front.

Orders on the storekeeper must be given in advance, so that material may reach its destination at the right moment.

Orders for material must state explicitly for what the material is to be used.

In unloading at the front, all empty packages should be reloaded and returned to the storekeeper for future use or disposition.

Material should be inspected as in other cases, except that greater care must be observed if possible.

Upon receipt of invoices, they should be compared with requisitions to see that orders have been properly filled; for this purpose, invoices should, if possible, be sent in advance of the goods.

When material is sent to the front without being inspected, instructions must be given accordingly, and it is the duty of the storekeeper to see that the work is performed subsequently by a trustworthy person.

In forwarding construction material to the front, the storekeeper should give the order to ship to the foreman of the yard; it should be explicit as to the thing required, name of consignee, place, purpose, etc. The foreman of the yard should carefully measure and inspect the material and furnish the data required for waybilling.

Each shipment should be waybilled, and the name of the conductor inserted on the bill. The bill should be receipted by the person to whom the goods are consigned, and the purpose for which the material is to be used stated thereon by him. The bill (or a copy thereof) should then be sent to the forwarding storekeeper to afford him the data he needs for his accounts, and determine the thing to be charged.

The yard should be under the direction of a general foreman. When the amount of material warrants it, the force should be divided into sections and classified, each section having a foreman.

The wages of foremen need be but little, if any, greater than those of laborers. They should perform the work of laborers. The authority they possess will serve to enforce greater discipline and responsibility than could be otherwise attained at equal cost. Such disposition will also build up a class of men that may be made useful afterwards in the operation of the property.

Fire precautions should be redoubled in the case of construction depots.

Sufficient force must also be maintained to guard the property.

A storekeeper should be appointed to take charge of construction supply depots. He should be experienced and should give his undivided attention to the work.

The duty of receiving, inspecting and caring for construction material is a thing in itself. The keeping of the time of men and the making of construction pay rolls, including the giving of discharge certificates, forms a part of the work.

Concentration is necessary to secure responsibility, thoroughness and promptness.

Attempt to blend the construction forces of railways with their operating forces is generally harmful. Construction work is something apart and requires peculiar talents and facilities, including those relating to accounts.

Construction storekeepers labor under disadvantages compared with those who handle operating material. Their facilities are generally limited and crude, while their assistants are, in the majority of cases, unskillful. At the same time the work must be conducted with the utmost dispatch and care.

A person of considerable experience as a storekeeper, and familiar with the methods of railroad builders, writes as follows:

"The handling of large quantities of material makes it imperative that the supply yard should be arranged with a view to economy in receiving and forwarding, as well as for convenience in handling. Under ordinary circumstances, and where there is sufficient room to admit of its being done, the yard tracks should be so laid that the more bulky supplies can be piled on separate tracks, having but one class of material to each track, and so grouped that the loading and making up of supply trains may be accomplished with convenience and dispatch. As ties constitute the greater bulk of construction supplies, they should be so piled as to insure the greatest economy of labor in unloading and reloading, and secure protection against fire at the same time. Convenient handling may be secured by putting the ties in long parallel ranks, leaving occasional intervals of about fifty feet; the ties to be laid adjacent to and at right angles with the track, and as soon as a rank is completed for the full distance required for the tie piles, the track should be thrown over sufficiently to admit of the construction of another rank. Where this plan is adopted, however, the track can only be connected at one end, leaving the other free to be swung. By this system, ties, in either unloading or reloading, need not

be carried for a much greater distance than their length. Another plan which admits of the use of both sides of the tie track for storage, and which allows a track connection at both ends, thereby making this class of material more accessible, is to arrange the piles in groups extending back to one-half the distance to adjoining track and with fifty-foot openings longitudinally at intervals of about one hundred and fifty feet. Ties in these groups should be arranged with the rank next to the track built up to the height of the car floor. The other ranks should extend back to the required distance, and at right angles to the first rank, but carried to a greater height. This plan, as compared with the former one, admits of a short parallel track being used, the advantage of which is that ties coming in box cars at the time track laying is in progress, can be transferred to flat cars (which, from their capacity for greater loads, should be used in construction) with less labor than would be necessary were they put off on the ground, thus saving their handling a second time. In addition to the force required to handle the material, the yard, if a large one, should have a good car repairer, who should have charge of all supplies for the repairs of cars and the delivery and shipment of oil and waste for train and other service. He should make a daily report to the storekeeper of all material used by him. The supply yard should be in charge of a general foreman, who should have supervision and control over the switch engine, and should be accountable for the general efficiency of the force, including the filling of orders, the general arrangement of supplies, and the proper inspection of piling, ties, rails, bridge timbers, etc. He should be assisted by a clerk, whose duties should be to check all supplies as unloaded or forwarded, and enter in detail the contents of each car on the yard book, and make a daily report of the same to the storekeeper. It should be the duty of this clerk to keep the time of men in the manner and form prescribed by the storekeeper."

Many of the foregoing details are well understood by those versed in railway construction, but they are not appreciated generally by railway men. Indeed, the handling of supplies is so little understood that particulars are eagerly sought by all.

In building railroads, freight, whether consisting of construction supplies or not, should be waybilled, and passengers should be ticketed; this will prevent confusion and insure accountability.

In closing construction depots, the amount of material left over, including the amount on hand along the line and elsewhere, should be inventoried and invoiced to the store-

keeper, or storekeepers, who will have charge of it, so that its disposition may be watched afterward.

It is impossible to prevent errors and omissions creeping into construction accounts. The result is, in some cases, a surplus; in others, a deficit. Whatever the balance may be (in closing supply depots) after deducting the value of the material on hand, it should be credited or charged, as the case requires, to the different construction accounts, in the proportion that the amount of material expended on each bears to the total amount expended.

When a construction supply depot is continued from season to season, an inventory should be taken at the close of the business year, or oftener if necessary, and the accounts made to conform thereto.

CHAPTER XIX.

TRANSPORTING COMPANY'S MATERIAL AND EMPLOYES, AND ACCOUNTING THEREFOR.

The bulk of the supplies used by a company must be transported by it for a greater or less distance over its own line. Very little material is delivered at the point where it is required for use.

The number of miles supplies must be hauled will vary. The average will never be the same upon any two lines. Consequently the expense will never be the same. Circumstances dictate the place of purchase. One company will be able to buy ties in the neighborhood where needed, another will have to buy at a distance; one company will be able to procure its fuel along its line, another will have to move it farther; one company will be able to buy lumber and timber near where needed, another will have to seek them at a distance.

The supplies of greatest bulk that must be transported for a greater or less distance are fuel, ballast, rails, ties, machinery, rolling stock and material for bridges, buildings, fences, platforms, etc.

The quantity of material to be transported depends somewhat upon its durability. This depends upon climate, quality, the use to which it is put and the care taken. Poor rails must be renewed oftener than those that are good, and a track subjected to the wear and tear of a heavy traffic must be renewed oftener than a track not subjected to such a strain.

Climate and soil have much to do with durability. Wood will not last as long in a hot climate as in a cold climate, and ties embedded in a damp soil will require to be renewed more frequently than in dry soil. The more frequent the renewal the greater the quantity of supplies to be transported; the greater the expense. The interest attaching to the subject is heightened by the practice of some companies of charging for hauling supplies.

I do not know where it originated. I know, however, that while the custom is not general, its advocates are sufficiently high in authority to have secured its adoption in some cases. The conservative railway commission of Massachusetts (an authority the railway commissioners of other states defer to in many things) in 1878 directed that the transportation of

fuel and material (except gravel) hauled for a company's use, should be credited to freight earnings at fourth class rates and should be charged to the proper accounts, and included in the tonnage.*

A practice having such backing cannot be passed over lightly. I can only notice its more salient features.

The practical effect of charging for the carriage of supplies is to increase the nominal earnings of a railroad and to enhance correspondingly the price of every article used, thus swelling the expense account. The rate charged is incorporated at once with the freight receipts of the line, and added to the cost of supplies on hand. When the supplies are used, the gross cost is charged to the account the material is expended upon. But until the material is used the supplies appear in the accounts as an asset. So that the effect is to swell the income and increase the assets by a like amount, thus apparently conferring a double benefit.

When supplies are used, operating expense and other disbursement accounts are debited, and thus, finally, the gain to income is set off by a charge. But the latter, unfortunately, never appears in the accounts simultaneously with the gain. Months may intervene.

A company must always keep on hand a large quantity of material. Whatever the amount is, the local earnings thereon appear as an asset, whereas they are really an expense. The accounts are thus misleading. A fictitious asset, dependent upon the amount of supplies a company uses, the distance they are hauled and the rate charged, is made to do duty as so much property, while legitimate operating expenses are shrunken by a corresponding amount.

When the earnings of a company are increased by charges on its own material, it is necessary to swell the tonnage correspondingly. Thus, commercial operations are magnified and distorted.

If the practice of charging for the transportation of material were universal, the harm would be lessened somewhat, because generally understood. Until it becomes general or is abandoned, the amounts that thus accrue should be stated separately in the returns, for the information of owners and investors.

Other objections to the practice suggest themselves. Charging for the carriage of material adds to the cost of accounting. It magnifies details. Thus, material must be weighed at the freight house and the charge extended. When it reaches its destination, the charge cannot be paid in cash as in other cases. Before the accounts of the agent can be

* Eighth annual report of Board of Railroad Commissioners, Mass., p. 87.

relieved, the charge must be formally examined and passed upon by the accounting officers. The earnings upon the material must also be systematically followed up and recorded at headquarters and at the storehouses, so that they may be disposed of when the material is finally used. This involves clerical work and increases the force, besides adding other expenses.

If the custom of charging for the carriage of supplies is to be incorporated in railway practice, it is clear that a fixed rate should not be charged for all kinds of material. Cost varies. Moreover, uniformity is repugnant to good business usage, and is demoralizing and misleading. Charges should be based on the ordinary tariffs of a company. They are the product of men skilled in the subject and exhibit infinite labor, and are the result of acute observation and thought.

While the transportation problem is a science still, perhaps, imperfectly understood, we are sufficiently versed in its mysteries to know that an arbitrary rate is unscientific.

Moreover, if it is right to charge for wood, coal, stone, ties, iron, fencing, and other material, as the Massachusetts commissioners suggest, why should ballast be excepted? The latter is an indispensable article and one of great importance, and exceedingly costly to handle. Its omission is clearly not justified. Its incorporation as earnings with other material, at fourth class rates, would quadruple the receipts of many lines. But whatever the increase might be, any benefit arising from the practice would be more than counterbalanced by increased cost of stationery, accounting, etc. It would also still further destroy the relation that operating expenses bear to earnings, by substituting an artificial for a commercial basis.

The subject is prolific of suggestions. If it is right for a company to charge for transporting its material, then it is clearly right to charge for the carriage of its employes. It is not only right but necessary. The employe handles the supplies; without him they are useless.

The charge for transporting material is made for the purpose of ascertaining outlay at the point of use, so that we may know the total cost of a thing.

But if the principle is right, why stop with material? To make the information complete we must also include the cost of transporting the operative who uses the material.

To charge for the transportation of employes would greatly increase passenger receipts. It would swell correspondingly the disbursement items affected.

The cost of keeping account of the movements of operatives and the debits and credits resulting therefrom would be considerable, but not greater relatively than for material. The two would warrant the formation of a special bureau of accounts.

Under a system of charging for supplies and operatives, earnings would no longer indicate profits or be dependent upon cash collections. They would depend upon the quality of a company's material, its durability, where it was purchased, the industry and enterprise exercised in moving it from point to point, the number of employes, and, finally, the celerity with which the latter traveled from place to place. All that would be necessary when times were dull and receipts light, or when it was desirable to exhibit large earnings, would be to load half a dozen or more trains with operatives or supplies and haul them such distance as might be necessary to make up the volume required. Such a system would be popular with receivers who get a percentage of earnings for their services!

However, the fictitious element which the practice of charging for the transportation of supplies and operatives injects into the accounts of a railroad renders it unadvisable, even if it did not increase expenses. Under it railway reports would no longer be trustworthy. We should ever be in doubt as to what was real, what was fictitious; how much of the property was *bona fide*, how much assumed. Our examination would resemble our examination of Jupiter—we should be forever striving to ascertain how much was solid, how much gaseous.

In many states taxes are based upon gross earnings; to charge for the transportation of supplies and men would add to the embarrassments of the subject, a subject already embarrassing.

It is impossible to enumerate the number and serious character of the objections that suggest themselves in connection with the practice of charging for transporting supplies and men. Enough has been said, however, to cause those who are interested to give the matter careful investigation before coming to a decision regarding it.

What I have said, however, it should be understood, does not apply to construction material, or men engaged upon construction work. In the opening of new lines and for additions, equipment and work properly coming under the head of construction, it is important that the whole cost should be known. Hence it is not only proper, but necessary, that a charge should be made for material and men carried in connection therewith.

Operating expenses are of an evanescent nature. Construction is something permanent. Upon the latter owners are entitled to a return forever. Hence the necessity of knowing the full amount. Other reasons suggest themselves why it is desirable that the exact cost of construction work should be known which it is unnecessary to enumerate here.

When it is desired to keep the operating expenses of different divisions of a road separate, the cost of hauling company material, such as fuel, rails, ties, etc., should be charged to the divisions using same, and the amount credited to the divisions performing the service. Such results can, however, be approximations only, as it is impossible to determine the precise cost of the haul because of the varied classes of material and the diverse conditions under which it is transported. Such charges, although lacking perfect accuracy, will nevertheless afford needed information as to the relative expense of operating the various divisions of a railroad.

In order not to swell the operating expenses of a company as a whole for such carriage, the charge for transportation should not be added to the price of the material, but should be added each month to the operating expenses of the divisions using the material, under the special heading "Transporting Company's Material." This debit will be offset in the returns by a corresponding credit to the divisions hauling the material.

By this method the objectionable feature of including credits for hauling company's material as Earnings will be avoided, while each division will be made to bear the cost of transporting its material. Thus there will be added to the operating expenses of, say, the Midland Division, an account known as "Transporting Company's Material," which will represent the cost of hauling its supplies over other divisions of the road. On the other hand, there will be deducted from the operating expenses of the other divisions the amount thus charged the Midland Division, the same being embraced under the head of "Transporting Company's Material." The debits and credits will thus offset each other, and so will not appear at all in the statement of operating expenses for the road as a whole.

In connection with the foregoing, it would be desirable, if it were possible, to charge the cost of transporting material to the Operating Account upon which it was used instead of to the account "Transporting Company's Material." But this is impossible, except in the case perhaps of ties and rails, because of the difficulty and expense of tracing the material until it is finally used for some operating purpose. Any attempt to apportion the amount to the various operating accounts affected would be at best only approximate, and therefore more or less misleading. It would also be desirable, if possible, to apportion the credits to the various operating accounts that bore the burden of carriage, namely: rails, ties, roadbed, bridges, fuel, repairs of engines and cars, train service, and so on. But it is apparent in this case that no accurate basis for distributing the cost of hauling the material,

to the operating accounts affected, is possible. Any such distribution, therefore, would be inaccurate and misleading. For the reasons stated, it is better therefore to have both debits and credits appear in the statements of operating expenses for the different divisions, as a special account, namely: "Transporting Company's Material," leaving the item out of the statement of Operating Expenses for the whole road.

CHAPTER XX.

THE SUPPLY CAR AND ITS USES.

A supply car may be used to advantage to distribute the petty supplies used by agents, sectionmen, towermen, yardmasters, lampmen, etc., along the line. Before its introduction, the distribution of these supplies, especially oils, was a source of annoyance and considerable expense, with very unsatisfactory results. Oil caused the most annoyance, as the baggage cars were daily cumbered more or less with small shipments of different kinds, with the attendant filth, and wear and tear of cans.

Experience has taught that a supply car can cover 1,200 miles of road monthly and do the work well. This, however, depends on the number to be supplied and the extent to which the car is used for distributing articles. If stationery is included the labor is greater than in the case of companies using other methods of carriage for this important supply. A convenient car is one, say, forty feet long (inside measurement), nine feet two inches wide over sill, seven feet six inches high, built after the plan of an arched roof box car. The side doors should be of baggage car type, so hung as to be easily operated. One end of the car should be of the same type as the ordinary caboose car, with the exception that the platform should be wider. There should be a ladder at each side door, in order that entrance and exit may be easy.

The oil tanks in the car should be rectangular, so that the entire space in the end of the car may be utilized. They should be so placed that the bottoms of the tanks will be eighteen inches above the car floor. Pipes should be connected with the bottoms of the tanks and should converge at a common point, with faucet attachments, so that the oil may be drawn from each tank without going from place to place in the car.

Each tank should have a manhole, to enable a person to enter the tank to clean it when necessary.

It is suggested that the tanks should hold: 2,000 gallons of kerosene oil, 500 gallons signal oil, 300 gallons car oil, 300 gallons valve oil, and 300 gallons black oil. This, however, like other features of the car, will depend upon circumstances.

The floor about the tanks should be covered with galvan-

ized iron or the tanks should rest in galvanized receptacles, to prevent the oil running down on the trucks, or the floor becoming saturated, which would increase the fire risk.

The car should be provided with a box to hold one or more bales of waste, the lid covering one-half of the top, the other half forming a counter for scales on which to weigh the waste before it is delivered. A broom rack should also be provided; also lockers running lengthwise of the car, for lamps, lanterns, etc.

A berth of the Pullman type is necessary for the man in charge; also toilet closet with wash bowl, water tank, and suitable cupboard for clothing, bedding, etc. A standard coach stove will be sufficient for heating in winter.

Two bracket lamps will furnish light for the main part of the car, one being sufficient for the end set apart for sleeping.

The car should have suitable shelves and racks for oil cans, jacks, tools, etc., and compartments and drawers in full view with the names of the contents plainly marked thereon.

Usually an agreed date is designated for making requisitions for supplies for the coming month. These requisitions, after being approved, should reach the storehouse at least five days prior to the scheduled date for the departure of the supply car. This will give the shipping clerk time to audit the accounts and make up a rough summary of what is needed, in form, say, as follows:

Name of Article.	Quantity.	Total.
Lanterns	1-4-3-2-	10
Brooms	1-2-3-1-	7
Axes	4-6-3-2-	15
Adzes	1-2-4-3-	10
Bars, claw	1-1-1-1-	4

Thus the total number (or quantity) of each class of material required for distribution will be ascertained. This determined, the supplies will be taken from the storehouse and arranged in the car for distribution.

By the time the car is ready to start, the requisitions should be arranged in order, according to the location of the stations, and as the car goes forward the man in charge should have the supplies for each station ready for delivery by the time the train arrives.

As the car is run on schedule time, being handled by a way freight train, the agents, section foremen, and others who expect supplies, should be on hand to receive them. Not only this, but they should have the old material at the car door to be delivered in exchange for the new. For no article, however small, should be delivered without the return of the old article. There should be no exception to this, except in the case of original supplies, duly specified. Thus an old lantern

oil cup will be required to be returned the same as a track shovel. This not so much because of the value of the article, as proof that the material has not been lost or misappropriated. The value of the article makes no difference. The old articles thus delivered to the supply car should be taken to the storehouse and there disposed of. Many articles thus gathered up, such as track tools, lamps, lanterns, etc., can be repaired and used again.

When there is heavy material, such as frogs, switch points, guard rails, rail braces, etc., to be distributed, an auxiliary car should accompany the supply car.

Stations requiring oil by the barrel and other bulky material which can be shipped in the original packages, can be best supplied by freight in order to save the labor of handling in the supply car.

In conclusion it may be said that handling of supplies from a car eliminates the annoyance of irregular deliveries, waste, breakage in handling, way-billing, packing, checking, etc., and avoids numerous complaints, which, however small, nevertheless engage the time of the officers and employes, and this, more often than otherwise, without satisfactory results. It also affords opportunity for the distributor to look personally into the needs of the applicants and to examine into and exact an accounting for articles in their hands, both of which are necessary.

CHAPTER XXI.

MATERIAL AND LABOR ACCOUNTS.

The railway science is so new and covers a field so vast that experts in particular departments are ignorant of the requirements of other departments. This will continue to be the case, as the evolutions of railway management are so rapid that the greatest industry upon the part of particular men is not sufficient to enable them to keep advised of its progress.

Inability to supplement the practical knowledge of individuals with the extended knowledge of groups of men exercises a retarding influence in the management of corporations. With more extended experience in the art of governing large bodies of men we shall be better able to concentrate and utilize the knowledge of the force as a mass. An obstacle at present is the lack of initiative; of individual freedom and interest; also the presence, more or less, of personal jealousies. As we progress in the art of governing, groups will be able to act as a unit with the singleness of purpose of individuals.

The operations of railroads evince each day the necessity of more definite knowledge of their workings. We discover this want in the relations of the railroads to the government; to each other, and to other industries. We discover it especially in their internal workings. The questions that present themselves continually in the management of these properties are: What do we know about this thing or that? Wherein is our knowledge of it correct; wherein incorrect? What is the best disposition to make of it? We are met everywhere by unknown quantities. This is so in reference to the fiscal affairs of railroads quite as much as in regard to their physical aspect. What are their limitations? What value attaches to exhibits professing to show details of earnings, operating expenses and construction? These exhibits represent things of the greatest importance, both of a private and public nature; the measure of income and outgo; the value of a property to the proprietor; its usefulness to the public; the relation of cause and effect; the gross and tare. If the information we derive is true, then our conclusions are intelligent; otherwise, they can not be.

In considering the value of fiscal data, we are struck with the importance of that which enables a company to determine the cost of particular things. If it rebuilds a bridge, or constructs a building anew, or improves a particular section of track, or reconstructs a locomotive or car, it should know the cost. Not exactly, perhaps, because there will be small discrepancies; supplies, for instance, are not measured for use with mathematical accuracy; the divisions of labor are not always exactly accurate; other petty discrepancies will creep in. Absolute accuracy of statement will thus be prevented, but the differences will be so small that no material interest will be affected thereby. These differences, it must also be remembered, arise mainly out of our economical methods; out of efforts to secure efficiency rather than theoretical perfection, when the latter entails added cost. A company must know all its items of expense with approximate accuracy. Here definite knowledge ceases. It would be valuable to know precisely the expense of operating particular parts of a road; the cost of the passenger business; the expense of the freight traffic, and many other impracticable things. If managers could determine the prime sources of outlay I have named, they would be able to act knowingly in some cases where they now act only upon shrewd conjecture. But they cannot. The extent of these outlays is largely surmise.

Theory and practice are not farther apart than the means by which railways arrive at an understanding of their affairs through the medium of their returns. While the aim is substantially the same in every case, the *modus operandi* of reaching the end sought differs. But so carefully and ingeniously have the various systems been thought out and applied, that it is often-times impossible to discover which is the best, which has the greater advantage. They are all meritorious. Each will excite the wonder of those able to comprehend the infinitude of thought and labor it involves.

To the mere looker-on it would seem as if the owners of railroads would find this diversity of method cumbersome and expensive; that the public would find it burdensome. Such is not the case. Both the stockholder and the public have been benefited by it through the interest the subject has excited and still excites among the vast army of men employed. The saving in cost and time effected by their inventions and devices cannot be computed. And when we remember that every dollar expended in accounting is unproductive, we may form some idea of the value to the community of these cheapening processes. The subject, however, is still in its infancy.

Cost of accounting is dependent upon many things:

1. Cost of labor will depend very much upon the location

of the property and the number of years the company has been in business.

2. Cost of supplies will depend upon ability to buy in the cheapest market, and as needed.

3. Upon the number of accounting divisions into which a property is divided.

4. Upon the skill of the officers and employes.

5. Upon the method of accounting.

In this connection it should not be forgotten that the cheapest form of accounting (i. e., the accounting department that is run at the least cost) may be the most expensive to a company, because of the inefficiency and irresponsibility it engenders; because of the absence of reliable details of administration. A system may, moreover, engender dishonesty by its failure to provide proper checks and safeguards. Thus it is a fact that the unsuspected depredations that go on where methods of accounting are inefficient greatly exceed those that are found out; that the unknown pilferings greatly exceed the known defalcations. Thus, an imperfect or cheap system of accounts may involve many times its cost in losses never known to owners or managers.

In reference to the fiscal systems outlined in this and the accompanying volumes, they are believed to be effective and economical.

The diversities that exist in railway accounting are not confined to any particular branch of the service. They are noticeable in both disbursements and receipts and in all the thousand and one things that grow out of them.

Methods for keeping disbursement accounts are not all equally good, yet all have many favorable points. The capacity of those in charge is important. A system that would work admirably under one man would not work well under another, in the same sense that a sword one man could wield effectively another could not lift.

Uniformity in accounts is not to be expected or desired, any more than uniformity in business. Railway affairs are too diversified, too complicated, too changeable; the talent, experience and interest of those in charge too dissimilar. We are indebted for the advances that have been made up to this time to the interest of individuals; to men of genius and research; to the open field they have had. We must still look to them. The uniformist ignores this class. Uniformity in business methods means the subjection of ideas to a dead level. The returns of railways to the government should be uniform. But their appliances and methods may well be as

diverse as the character of the country they traverse or the measure of ability of those in charge.*

In publishing this and other treatises on fiscal affairs, I wish it to be understood that I do not attempt to discuss the subject exhaustively. Nor do I claim that the methods I suggest are the best; I give them simply for what they are worth; for the information of those concerned. Of course, I think them as good as any, or I would not publish them. There is nothing unreasonable or egotistical in this. When, therefore, in my books I speak definitely or authoritatively, the reader will understand that I aim only to be precise in reference to the particular thing referred to, not that I think my way is the only way, or necessarily the best.

In reference to the fiscal regulations governing Labor and Material, there are so many things that tend to render systematic and effective accounting difficult that the subject invites the most exhaustive inquiry. Those who have studied it find their labors never ending.

Definiteness in accounting for Material and Labor may be secured approximately, but not absolutely.

The service requires the enforcement of arbitrary regulations that will prevent omissions, errors and improper practices; that will enforce responsibility; that will secure authoritative returns; that will not allow the accountant to run into extravagance and dilettanteism.

Extravagance in accounting cannot be too severely condemned. On the other hand, pinching economy that fails to recognize and enforce responsible methods, merely to keep down the pay roll, is infinitely worse than extravagance. This fact cannot be too strongly impressed upon owner and manager.

The diversity that characterizes the practices of railroads in connection with their fiscal affairs and in their methods of management is noticeable in the systems they have severally adopted for handling the Material they use. Upon many roads the purchasing agent has entire charge of everything relating to material. He buys, receives, inspects, cares for and disburses. His powers are autocratic. No check is placed

* My attention was first called to the subject of a uniform method of keeping accounts by a railroad commissioner, a lawyer and a gentleman of the highest distinction. His position and the persistence with which he urged the matter dignified the subject. I have accordingly referred to it in my recent books. A uniform method of keeping railway accounts appears to me very much like having our hats, boots, breeches, shirts, men and horses of a uniform size. It is an admission that progress is practically at an end. Its immediate effect would be to benumb the intelligence and interest of a hundred thousand men connected with railway accounts in the United States alone, and substitute therefor the interest, experience and intelligence of a very limited number of men.

upon him. He is trusted implicitly. Upon other roads his jurisdiction is restricted. A check is placed upon him, as it is upon the treasurer; his authority is only concurrent. He makes the purchases, while some other department, perhaps the master mechanic, superintendent or engineer, cares for and disburses. Upon still another line he simply buys, while the accounting department receives, cares for and disburses the material under orders from the operating department. Under this last named method the concurrence of two (and in some cases three) independent departments of the service is secured. This insures a check in harmony with the principles governing corporate accounts.

The diversity that characterizes the keeping of material accounts is also noticeable in connection with those relating to Labor. Upon some roads the time of employes is kept by the operating department, master mechanics, superintendents and others. Some companies have timekeepers especially appointed to perform that office. The methods by which the Labor accounts may be kept are infinite. However, the method is not nearly so important as that it shall enforce accuracy and truthfulness; that the time of employes shall be correctly kept and faithfully charged to the thing upon which expended.

The keeping account of the Wages of men and the distribution of the same to the accounts affected cannot be left to chance or to the hazards that attend irresponsible methods, any more than a company's traffic or its money can safely be left to chance. We must know that the men have worked and that the rate allowed is right, otherwise the crowding of the pay roll with fictitious names, while it may not become a matter of universal occurrence, will be frequent. To enforce accuracy in keeping account of the wages of men, the time must be kept under the direction of persons acting independently of the person who hires or the official who directs. In fact, the principle of corporate accounting must be observed, namely, that the persons who manage shall not also act as their own auditors.

Mechanical devices, while important, may be safely left to the ingenuity of those in charge.

There are two methods of keeping the Material and Labor accounts of railroads; one in which only Results are known at headquarters; another in which all the Details are known. The accompanying book provides for the latter. Thus, if twenty thousand dollars are expended in constructing a passenger depot, the items that make up this sum are accurately, *and without extra cost*, known to all interested.

I consider it of the utmost importance that every detail of expenditure, no matter how far away from the general office the expenditure may have been made, should be known to the

operating officers and those in charge of accounts at headquarters. Some who admit the desirability of this, object to it on the ground of cost. Cost does not cut any figure. The information may be known without the expenditure of a dollar. Not only this, but the details may also be known to all local officers without extra expenditure. In explanation I respectfully refer the reader to the chapters on Labor and Material. The plan is very simple. The details of these accounts as written up by those in charge along the line of a road should be transcribed on forms prepared for the purpose. At the end of the month, when the accounts are closed, an impression is taken of the returns, after which they are bound in book form and sent to headquarters, and in being sent to headquarters are sent through the intermediary local office. Thus everyone interested is kept informed.

The manner of keeping material and labor accounts at shops and elsewhere must be fully thought out in advance. Upon it depend faithful service, efficiency, reliability, economy of expenditure, or the reverse. Upon it depend whether the supply of material on hand shall be kept down as much as possible, whether material shall be carefully inspected when received, shall be carefully .guarded afterward, shall be disbursed only so far as the service requires, and shall be protected after being disbursed; upon it depend whether the time of men is accurately kept, whether the wages are right, whether men have worked as represented; also, whether the pay roll is charged to the accounts upon which the labor was expended. These are vital things and upon them depend whether a company shall have an efficient or inefficient management; whether there shall be economy or extravagance, energy or sloth, honesty or trickery, responsibility or irresponsibility.

The accompanying system, while far from being perfect, is sufficiently comprehensive to protect with reasonable fullness the company using it. It is in the right direction. From its study and that of other systems something better will grow. It shows under what heads disbursements are to be charged and a careful division of Operating and Construction accounts is given. These classifications are those officially promulgated by the United States government. They are not the result of any particular man's labor. They represent what may be called the accretions of years. They are practically perfect in this, that they embody the more specific things that such distributions should contain. They will not, however, it is probable, please everyone. Some will require that the divisions be more minute; others that they be not so minute.

The enumeration of items that enter into each operating and construction account, as given in detail herein, was first

collated by the writer many years ago. To the casual observer it does not seem important, but to practical accountants its value is apparent. It is only by such minute designation that we can hope for a uniform classification of disbursements. It enables storekeepers, timekeepers and others to charge exactly the same thing to the same account everywhere and at all times and under all circumstances; without it they could not do this.

Wherever two or more men are expected to co-operate intelligently, without clashing or contention, they must be governed by well understood rules. There is the same necessity for such rules in the government of railways that there is for general laws. Each road, however, requires rules and regulations peculiar to itself, just as states, cities and towns require laws peculiar to themselves; just as businesses alike in nature, but carried on by different men or under different circumstances require different methods of administration.

This book is intended to give in detail some of the more important practical rules and regulations governing labor and material. It explains certain methods found by practice to be efficacious. The attention of the reader is invited to the forms used. The value of these will grow upon him as he becomes more familiar with them. Seemingly dry and unimportant, it is no exaggeration to say that the gross revenue of railroad companies would not be sufficient to pay for keeping their accounts if they followed the old method of bookkeeping that our forefathers observed. The money now divided in the shape of dividends and paid out in interest would not be enough to pay for clerk hire and stationery. But while economy is sought, the necessity that exists for accurate and scientific accounting in connection with the operation of railways is not for an instant lost sight of; the methods devised, while cheaper than those of merchants and bankers, are even more carefully constructed, even more secure, even more effective in their operation.

The volume is intended, as its name implies, to afford the reader an accurate and concise description of the disbursement accounts of a road, what they are, how they are kept, and how they are grouped. I have not attempted anywhere to discuss the subject except from the practical standpoint, the standpoint of those who desire to know concisely and accurately what the subject covers, what is requisite to be done in order to provide necessary facilities for keeping the disbursement accounts of a road and surrounding them with needed safeguards.

CHAPTER XXII.

TITLES OF RAILWAY OFFICERS AND EMPLOYES—KEY TO THEIR SIGNIFICANCE.*

As titles seldom have the same meaning upon different roads, or a like meaning for any length of time on the same road, it is necessary, in any discussion of matters affecting railroads generally, to avoid the confusion their use would occasion. This may be done by using only those of a general character. This is the rule I have tried to observe in my books. Thus when I refer to the "treasurer" I mean the financial officer in charge; on one road he may be a treasurer; on another a vice-president, comptroller, cashier, paymaster or clerk. The title "accounting officer" is used in the same way; under that general head all officers who have authority in connection with the accounts are grouped, and when reference is made to the accounting officer it means the particular officer whose duty covers the thing in question, whether performed by a chief clerk, ticket accountant, freight auditor, auditor, comptroller or vice-president. In the same way the title of "storekeeper" represents the person who has charge of the supplies of a company at the shops and along the line of a road, or who renders returns thereof. Two distinct officials may perform these duties. The title of storekeeper also appropriately covers the person who keeps the time of men and renders account thereof, because he generally has charge of material as well. Upon some roads the storekeeper will be the master mechanic, upon others the foreman, division superintendent, civil engineer, stationer, clerk, timekeeper, and so on.† The title of "agent" naturally covers those in authority at stations;‡ it includes the agent, ticket-seller, cashier, clerk and other attaches. The title of "counsel" covers those connected with the legal department; "traffic manager" those

* The duties and responsibilities of the different officers of a railway company are more fully treated of and the provinces of the various departments defined in the volume of this series on the organization of railways.

† Indeed, all of these officials have more or less to do with material and labor accounts. I suggest the title of "storekeeper" because it applies more generally than any other.

‡ The title of "agent" is also sometimes used to designate any person in the employ of a railroad.

having charge of the traffic; "division superintendent" the official having charge of the operating department of a division, including the civil engineer of a division, although the latter may be an independent officer. The title of "manager" is used in a general sense to designate the officers collectively who manage the property. The title of "general manager" means the highest known managing officer; he may be a president, general manager or superintendent.

With this explanation the general application of titles, in the sense I use them, will be understood. When I find it necessary to use a title of any kind I use that which seems most appropriate, not as expressing an opinion, directly or indirectly, as to what a particular title should be, or what the official possessing that title should do in all cases.

CHAPTER XXIII.

GENERAL RULES GOVERNING CARE OF MATERIAL AND ACCOUNTING THEREFOR.

[NOTE.—In connection with the Material accounts, I may say for the information of those who are not versed in the technicalities of accounts that all material (including fuel) that is reported as received in store is a charge against the recipient; all material (and fuel) that is included in the returns as being disbursed, sold, or shipped away, is a credit to the person making the report, and a charge against the thing upon which it is disbursed. In the final entries on the general books of the company, made from the summaries of returns, debits and credits have this basis. Thus, material embraced on one side of the return is the same as a charge, while if included on the other, it is a credit.]

Before attempting to indicate the specific rules and regulations that must in the main be observed in connection with the care, distribution, use and accounting for material, let us consider briefly what are the requirements as regards the fitness and responsibility of those interested.

Matters relating to the material of a company concern every officer; but more particularly, those who order, buy, receive, inspect, care for, disburse, use and finally account for it on the books and in the returns.

The measure of responsibility and extent of knowledge required of those in charge of material is not the same in all cases—they differ as they do in other departments of the service—but it is essential that the theory and practice of accounts governing material and labor should be understood by everyone, otherwise they will not be able to act harmoniously, and the service will suffer from inefficiency, extravagance and contention.

In the conduct of material and labor accounts the design should be that each storekeeper and timekeeper should have his particular sphere of duty; that he should be respected therein; that those about him should co-operate in every way with him to increase his usefulness, and that he in his turn should be particular not to infringe upon the duties and responsibilities of others; and, finally, that all should act harmoniously for the common good.*

* Those who have charge of the receipt, care and disbursement of material and are charged with the responsibility of accounting therefor, are, for convenience, designated herein as "storekeepers." This title applies alike to the person in charge of the material at a shop, or

At many points on a line the care of material is a mere incident, the value and quantity on hand neither necessitating nor justifying a storekeeper. Nevertheless, the material should be looked after with the same intelligence and faithfulness that petty cash collections are looked after at small stations. The amount of cash is never a matter of consideration in providing for its safety; everything necessary to protect it is studied in advance and rigidly enforced. A loss of cash, no matter if it does not amount to more than a few shillings, is not looked upon as excusable. The same principle should govern the care of material. It should be protected everywhere and under all circumstances, without reference to the quantity or particular value, so far as it is possible without incurring expense out of proportion to the risk involved.

Those with whom the duty of looking after material is an incident only should still take accurate account of the material they receive and expend, should guard the supplies intrusted to them with unceasing vigilance, and while they may not possess the discretion of division and shop storekeepers, it is their duty to report any act or impression connected with the handling of material whereby the service may be benefited. The interests of all are alike in this regard.

At the shop storehouses of a company the extent of the work requires the employment of a particular person to take charge of the accounts and supplies. He is called a storekeeper. He must be especially versed in his business; it is necessary that he should understand not only the theories but the practices connected with material accounts; he should also be familiar with the kinds of material that the company uses, and with each article thereof, so that he may be able to judge of its merits. This last is necessary to enable him to inspect it properly and determine whether it corresponds with that paid for by the company. He should understand the question of supplies in general and in particular. Unless this is so he will be unable to avoid embroiling his company in disputes with merchants as to the merits and value of articles received from them that might otherwise be avoided. The storekeeper must not only be experienced, faithful and observing, but he should be obliging, courteous and frank.

The storekeeper's association with and dependence upon others require that he should possess tact and patience. While exercising the utmost watchfulness to see that his com-

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storehouse, or fuel supply depot; to a division superintendent, civil engineer, roadmaster, stationer or any other person *who is charged with the responsibility of receiving, caring for and disbursing material and rendering returns thereof.* Those occupying a less responsible position, who handle material, are designated by some other title, so as not to confound the duties or responsibilities exercised by them respectively.

pany receives that which it pays for, he should not under any circumstances or pretense attempt by direct or indirect means to wrong a person from whom material is bought, or deduct anything from that which is really his due. The storekeeper is a custodian, and is bound to report the facts exactly as they exist, neither omitting nor adding anything. This is the duty of the accountant everywhere and under all circumstances. He is a historian merely of that which occurs about him.

It is the duty of the storekeeper to see that that which he receives is genuine; to carefully husband it, and to disburse it only upon authenticated orders.

The duties of the storekeeper, no matter how great or how small the amount of material intrusted to him, require that he should take the best possible advantage of the facilities at his command; that he should so arrange his storehouse and dispose of his material as to most conveniently receive, inspect, watch and disburse that which passes through his hands. This will require him to study his resources carefully and make the most of them. He should so arrange his material as to prevent its being taken without his knowledge, or, if otherwise obtained, that the abstraction may at once be called to his attention. This duty is extremely difficult where the material is scattered, as it necessarily is at many shops. Nevertheless, it should be so arranged as to be under his inspection from day to day, if not actually under lock and key. He should, so far as he can, devise means to protect the supplies from the weather, and to so arrange them as to save labor in handling, and reduce the cost of inspecting and inventorying to the minimum. His duties are what his title implies. Whether he is a good storekeeper or a poor one will depend upon the measure of his talent and industry. There are both good and bad storekeepers in mercantile life. The former are those who study the situation and take advantage of its opportunities. The same rule holds good with the storekeepers of a railway company. The one who gives his duties the most thought and attention will be the best, and his reward in the long run will be the greatest.

The material that a company uses in its construction and operating work covers every article known in the mercantile world. Not all of these, however, pass through the hands of every storekeeper, their duties are varied according to the location and particular purpose of the storehouse; thus, a construction storehouse is opened for new roads built or old ones extended; a storehouse for material used at shops and roundhouses; for track material; for bridge and building material; for stationery and blank books; for supplies for dining and business cars and lunch rooms, and so on. Some of these may be consolidated. Those in charge require to be especially

versed in the duties of their office. Notwithstanding this practical knowledge, the good of the service requires them to seek hearty and active co-operation of those about them who are more familiar than they by actual experience with material, more especially those likely to render them good advice. The storekeeper should combine the intelligence of those about him with his own, and not seek to stand alone. In no other way can he keep himself advised or familiar with the value and purposes of material or the changes that occur from day to day. The changes in this branch of the service are more important and more frequent than in any other department of industry in the world. In every field railway appliances are in a transitional state. They are not perfect in the machinery department, the track department, the train department, the station department or accounting department. Betterment is the watchword in every branch of the service. It is the duty of storekeepers to keep themselves advised of these changes as they occur. Otherwise they cannot handle intelligently the material they receive.

The duties of storekeepers, as will be seen from the foregoing, require something more than involuntary or mechanical service. And while they may have no discretion in regard to the quality of material bought, cannot add a jot to the facilities they possess for handling supplies, nor be able to say that material may or may not be used, they, nevertheless, possess wide discretion, and have ample scope in which to exercise intelligence and display business ability. Their knowledge of the uses of material, acquired by handling it, renders them of great assistance in determining the kind and amount required. It also enables them to discover any surplus on hand or any old or new material not needed, or that has become obsolete. This knowledge is of great value in preventing the unnecessary accumulation of material, and of disposing of that which a company no longer needs.

The value of a storekeeper's services to officers and others, in connection with the ordering and use of material, adds greatly to his usefulness. But his value in this regard, it may be observed, will be measured by the intelligence, zeal and tact he displays in communicating his knowledge to those who have practical use for it.

The duty that devolves upon storekeepers of looking after supplies while in their hands, should not cease altogether after the material has passed into the possession of others. Their jurisdiction, so far as they are able to exercise it, requires them to see that material is not misappropriated or lost afterward; and in the event it is, to require reparation therefor. This duty is especially urgent in the case of brasses, tools and utensils of common use. It is within the discretion

of storekeepers to require, in making disbursements, that the old or worn-out article that is to be replaced should be returned or duly accounted for. This duty is very far reaching in its application. It extends not only to the tools used by carpenters, machinists, blacksmiths, painters and others about shops and roundhouses, but to the implements that are used upon trains, upon the tracks, and at stations, watersheds, fuelhouses and yards; everywhere, in fact, where the return of the old article will prove that it has been properly used. In many cases the articles thus returned will have no value, or but a nominal value at best. However this may be, the application of the rule will be useful in enforcing care in the use of a company's property. Moreover, in many cases articles thus returned may be repaired and re-used with little expense, that would otherwise be thrown away as useless. No one except those who are familiar with the purchase and handling of material can judge in such matters. Many articles that apparently have no value whatever may, with the expenditure of a trifling sum, be made serviceable, or may be made to realize something in the market. It is the duty of storekeepers to keep themselves advised in regard to matters of this kind; it is in their power to add greatly to the economical use of supplies, and to realize, through their zeal, experience and tact in the use of tools and other implements and the return thereof, vast sums of money which under other circumstances would be lost without anyone suspecting the fact or realizing the amount.

One of the reasons why the original outlay and expense account of corporations is greater than that of private concerns is because of the increased cost of petty things. It is possible, by the exercise of minute and salutary rules, to correct this evil in many respects.

The proper disposition of material passing through a storehouse is of the greatest importance to a company, from whatever point viewed. The exact measure of discretion, however, that may be allotted storekeepers, in order to derive the greatest benefit from their services, can only be approximately determined. It cannot, however, extend absolutely beyond the inspection, count and custodianship of the goods. The right to watch over their use, after they have passed from their hands, they must exercise with others. It is primarily the duty of the operating officer, into whose hands goods pass, to see that they are expended economically and in good faith. The measure of discretion that the storekeeper will be able to exercise outside of his defined duties, it is apparent, will depend upon his industry, experience, faithfulness and ability to work harmoniously with those about him. The call for his services will depend upon the possession and exercise of these

qualities. As the recipient of material bought, the storekeeper is practically the auditor thereof; his record of material disbursed forms the basis of all charges on such account.

The precautions to be observed in the care of material, it is manifest, depend very much upon its nature. Many articles do not offer temptation or facility to pilferers. On the other hand, the list of those having an immediate appreciable value is very great. These require to be watched with the same care that a cashier watches money in his drawer. They comprise oils, brasses, tools, hardware and portable articles of a general nature that the company uses in its service. There is still much to be learned in regard to the best manner of protecting property of this kind; but that which has been found most simple and efficacious is the system of exchanges, namely, the requiring of the return of the old article when a new one is needed to replace it. Its enforcement does not require elaborate accounting; it is very simple and inexpensive. Its immediate effect is to emphasize the relative care exercised by those who use material of this description. If they are careful it is at once apparent; if negligent, the fact can not be long withheld. The great value to a company of the system of exchanges in the case of brasses has long been determined; its introduction in one instance at once cut down the cost to the company of such material one-third.

The necessity of returning an article when through with it suggests the necessity of protecting it meanwhile. The enforcement of a rule requiring the return of old or broken tools and other utensils, it is believed, will be quite as salutary as in the case of brasses. It will emphasize the fact of ownership in a company, and the return of the old implement will serve as a voucher for the procurement of another to replace it. The pride that men feel in caring for property intrusted to them, and the further fact that such care is known and appreciated, will intensify their interest.

In carrying out the principle of substitution, elaborate bookkeeping is not necessary. An account should be opened with the person to whom articles are given; when they are returned the storekeeper may run his pen through the entry or a mark may be set opposite showing that they have been returned and new ones issued in their places. The method of accounting is unimportant, except that it should be simple and inexpensive, and yet comprehensive enough to accomplish the purpose desired. As often as once a month a general inventory should, if practicable, be taken of articles thus outstanding. At shops an inventory should be taken much oftener; indeed, it would be well that tools should be returned at night and redistributed in the morning.

While the discretion of storekeepers in regard to the dis-

bursement of material is restricted, nevertheless in the event any order they receive should seem to be ill timed, excessive or improper, their privilege and duty require them to call the matter of the attention of the responsible operating officer immediately in charge. A faithful cashier, when he receives a check that while technically right seems yet to be wrong, will, before acting upon it, take measures to ascertain its accuracy; in the same way storekeepers will consult freely and fully with the officers in charge in reference to matters of interest or concern about which there are any doubts.

The duties of the storekeeper concern not only supplies awaiting use, but extend also to scrap and other old material. Every ounce of material of this kind possesses a value that is no more to be disregarded than the small change that finds its way into a ticket seller's cash drawer; it should be looked after carefully, should be accurately weighed—so far as facilities will permit—and should be brought upon the company's books with as much concern as if it were of inestimable value. The duty of looking after the scrap of a company and securing due return thereof is one of extreme difficulty, and invites the earnest attention and forethought of everyone.

While the duties of storekeepers in reference to the care of material have been thus fully defined, it should not be forgotten that the duties of operating officers in the premises are even more imperative. They should be active in every direction to prevent the extravagant use or misappropriation of a company's supplies. And in order that discipline and concurrence of knowledge may be secured everywhere, and at all times, it is made the duty of operating officers at shops and elsewhere to see that those who have the custody of material, whether as storekeepers or foremen, exercise prudence and faithfulness in the performance of their duty, and that they carefully guard the supplies in their charge and enforce such measures of precaution and economy as may be necessary. This supervisory duty is an important one, but is not onerous from the fact that the presence of the official in charge, on the ground, renders the task easy. His duties and those of the storekeeper are reciprocal.

The supplies of a company represent cash. They cost cash. Their waste, improvident use or loss is the same to the company as the loss of cash. The same principles should, therefore, govern. A storekeeper is the same as a cashier. His implements are different, that is all. It is his duty to see that that which he receives is genuine; that the count is full; that the goods are faithfully protected and guarded; that they are disbursed only on properly authenticated vouchers; and, finally, that full and complete records and returns are made.

In order to secure harmony and efficiency, the duties of

different departments (and, as nearly as possible, of different officials) should be defined as accurately as circumstances will admit, so far as they relate to the handling of material. The service should be impersonal; those concerned should co-operate heartily with each other without transgressing the limits of their particular duties. The great quantity of material and the widely separated territory over which it is handled render this necessary.

Material must not be charged to an expense or construction account until actually used. An exception may, however, be made in the case of petty supplies sent to stations for actual use, where the cost of accounting would be considerable and the measure of information furnished of no practical value. But in regard to supplies stored at shops and other depots and centers of supply, or in the hands of trackmen or men engaged in repairs and construction of bridges, culverts, buildings, fences and platforms, it is intended that they should be charged, when received, to the person responsible for their custody and proper distribution; but this person should not, under any circumstances, charge them to an account until they are expended thereon. Those in charge of track, buildings, bridges, culverts, shops, roundhouses, fuel depots, as well as storekeepers proper, are required to make return of material taken from store for actual use; also the amount of material and scrap on hand. In this way a company is kept advised, not only of the gross amount of material on hand, but the amount at different places, also the particular kinds of material. This positive knowledge enables officials to act intelligently and to prevent the unnecessary accumulation of material that would occur if the company's measures did not enable it to determine, at a glance, exactly the material on hand, and the quantity, location and value thereof.*

Generally speaking, the method of business that accomplishes results with the least expense and friction is the most desirable for business purposes, and the one that experienced and practical men will most readily accept and carry out. This is the method sought to be embodied herein; its purpose is to achieve results by the simplest and least expensive means consistent with necessary safeguards. Observances are held subordinate to practical results. The forms used are the

* It was formerly the practice to charge much of the material used directly to the account upon which it was to be used, when bought. This was especially so in regard to road material. The practice grew out of the difficulty of securing effective accounting. This difficulty has been largely overcome, and measures are so perfected in this direction, at the present time, as to enable a company to keep in many respects as intelligent and effective account of its supplies as that kept by a merchant or manufacturer. These methods, however, are not by any means perfect, and all concerned in the handling of material should keep in mind the necessity of further perfecting them.

best and cheapest that experience suggests; they will require to be modified or enlarged from time to time, according to the vicissitudes of business and experience. For this reason those in charge of material accounts should not allow the glamour of forms or practices to take too firm a hold upon them; they should keep themselves unprejudiced, so that they may view the work of the accounting department with the same cynicism that those about them observe. They are expected to pursue practical things; to avoid the purely ideal; to weigh forms and devices by the benefits derived therefrom. Any method that does not have a present or prospective value over and above its cost, is extravagant, wasteful and demoralizing.

Material may not be ordered by a storekeeper except to meet actual demands, based on the expressed wants of others, nor can he disburse it except upon orders from the official in charge, or his duly accredited representative. These orders are his vouchers, and he should preserve them with the scrupulous care that a banker preserves drafts that he has paid.

The routine of bookkeeping, as it affects material, is very simple. Each transaction, however, involves a special phase of accounting.

When material is received by a storekeeper he compares it with the invoice and duly records the quantity, price and total value on his books and in his accounts. He re-embodies this information in the returns which he makes of material received. This latter forms the basis for making the charge against him and for crediting the official who bought the material or the storekeeper by whom it was shipped. When material is disbursed, the storekeeper should have an order therefor, which he files away. If material is shipped, an invoice accompanies or precedes it. Material disbursed is charged to the account upon which expended. If it is shipped to another storekeeper, it is charged specifically to such person. If it is used for construction or operating, it is charged thereto. Each storekeeper enters the disbursements he makes, like receipts, in due order in his returns. The amount he disburses is credited to him. All this information is needed by the accounting officer or person who audits the accounts of storekeepers; it may be rendered in separate statements or all embodied in a consolidated return; the latter plan is the one suggested herein. A detailed and separate statement is made by each storekeeper of the material he receives, ships away, sells, exchanges, otherwise disburses, or uses; at the end of the month he takes an impression of these statements, after which he binds them together in the form of a book and forwards them through the proper channel to the officer whose duty it is to finally examine and place the results they dis-

close on the books of the company. The plan is simple, cheap and effective.*

In accounting for material scattered along a line, the following provision has been found effective: Petty supplies distributed by storekeepers for current use or supply at places having no clerical facilities are accounted for by the storekeeper making the disbursement. The same rule is followed in reference to station and train material. Track supplies for each line are accounted for by the storekeeper for such line; in some cases he is superintendent, in others, a storekeeper proper, in others an engineer. Material used by gangs of men engaged in repairs of buildings, bridges, culverts, fences, stock yards, platforms, etc., for each line or division is accounted for by a central storekeeper.

The rules and regulations for handling the accounts contained herein are such as experience suggests. The central idea is to make the writing up of the records at the initial point on the line answer the varied purposes of all officials who have occasion to keep themselves advised. Thus the records written up at the storehouses for material are sent forward through the offices of the various operating officials interested in such matters. Before these returns are forwarded, an impression copy is taken of them by the storekeeper as already stated.† In this way all the operating officers interested have an opportunity to inspect the returns in detail without the company being put to the expense of retranscribing them in their several offices. In the event officers at any time require details of an account, they may quickly and easily obtain them by reference to the office where the record was originally written, or where it is finally lodged. The official who becomes custodian of the returns uses them as vouchers. He need not retranscribe them in detail upon his books; only the footings need be posted. Thus the records of storekeepers, superintendents, civil engineers, roadmasters, bridge and building foremen, stationers and others who perform the duties of storekeeper, no matter what their titles may be, will be finally lodged in one office and form the basis of the company's report of disbursements.

The system of accounts provided for herein contemplates a minute classification of disbursements as between operating expenses and construction; in the event of doubt or dispute, the matter is to be referred to the proper accounting officer

* For a more detailed description of it, see what is said in reference to the distribution of material book.

† In the event the sending of the distribution of material book through the offices of operating officials would engender too much delay or occasion inconvenience, an extra impression of these returns may be taken by the storekeeper and forwarded to the operating officer in charge, and through him in turn to all others interested.

for decision. It is not the province of a storekeeper (or timekeeper) to favor one account at the expense of another. It is his duty to record the facts exactly as they occur. This is one of the objects sought to be attained through the system embodied herein. It is a vital matter. In the event a storekeeper is also responsible for the expenditure—in other words, where he acts both as principal and accountant—he must still render unprejudiced returns. In such cases it is his duty to appoint a competent person to take charge of the accounts of his office and act as storekeeper; the latter should be unimpeded in the discharge of his duties; he should apportion expenditures exactly as they occur, in accordance with the facts, without reference to how the showing affects the official in charge. Thus, those in charge of track acounts will not attempt to debit construction with expenditures that properly belong to operating, or vice versa. Unless the accountant (be he who he may) is impartial in the discharge of his duties, the deception the company risks and the losses to which it may be subjected in consequence will readily suggest themselves; they as readily suggest the necessity of putting the accounts in the hands of those who will render impartial returns thereof.

Impartiality is one of the objects sought to be attained in suggesting that storekeepers at shops be relieved from immediate responsibility to those who buy or use supplies, all incentive to act prejudicially being thus avoided. Not being responsible for the purchase of material, it follows naturally that they will render true returns thereof; not being responsible for expenditures of material, it follows correspondingly that they will make true returns thereof. They occupy the same relation to the operating department that the commissary occupies to the quartermaster's department of the United States army. One buys; the other audits.

Such is, in general, an outline of the system embodied herein. But in order that so far as possible there may be absolute unanimity in the handling of supplies and the conduct of accounts, formal rules and regulations become necessary. Those that occur to me I give in the following pages. They should be carefully studied by those interested, not only in relation to particular things, but in the relation they bear to the method of handling supplies as a whole. These rules, like those contained elsewhere in this book, apply to everyone, and should not be disregarded except special and particular reason exists therefor, of which the official in charge of material accounts should be the judge.

CHAPTER XXIV.

MANUAL OF MATERIAL ACCOUNTS AND METHODS.

[NOTE.—As the rules and regulations governing Requisitions and Orders for Material are incidental to the subject matter contained herein, the reader is referred to the chapter treating of Requisitions and Orders for Material. A request for material to be purchased is called "Requisition for the Purchase of Material"; a request for material to be transferred from one storehouse to another is called "Requisition for Transfer of Material;" a request for material to be taken from stock for immediate use in shops, yards, etc., is called "Order for Material."]

The material accounts of a company represent supplies on hand not in use, including new, usable and scrap material.

All material in store is charged specifically on the general books of the company to its custodian.

Material bought by the purchasing agent is charged directly to him when purchased. Upon acknowledgment of the receipt of the material by the storekeeper to whom it is forwarded, it is charged to such storekeeper and the purchasing agent is credited therewith.

No material should be charged to a storekeeper until reported as received in his distribution of material book; the same rule should be observed in regard to fuel.

Storekeepers should also be charged with all old material (both usable and scrap) which accumulates; they are required to credit such material to the proper account in their distribution books in the month in which it is received.

Storekeepers are credited with material disbursed and with material forwarded by them to other storekeepers.

Material disbursed should be charged in the distribution books to the account for which it is used; the storekeeper will be credited with the total amount of material disbursed by him each month, provided the items are found to be correct.

No material should be charged to an account until it is actually taken from store to be used for such account.

Material shipped to points on the road where there is no storekeeper, as at isolated roundhouses, car repair yards, stations, etc., should be accounted for by the storekeeper who ships it. It is the duty of the storekeeper in all such cases to require reports (daily, semi-weekly or weekly) from the foreman or other official in charge, showing the quantity of ma-

terial used and the purpose for which it is used. These reports form the basis for writing up the storekeeper's monthly returns.

Petty supplies delivered to stations, offices and trains for current use, should be charged when disbursed to the account for which they are intended to be used.

Material should be invoiced and charged at the purchase price, plus subsequent charges; if it has been carried forward from a preceding year, it should be charged at the last inventory price.

Transportation charges paid by a company on material and fuel for use in operating the road and for construction purposes should be added as a part of the cost; if the charges are payable by the seller, they should be deducted from the invoice and voucher in his favor, or if this cannot be done, a bill should be made against him for the amount.

In order that the accounts upon which supplies are expended shall show the full cost thereof, it is desirable, so far as practicable, that the cost of handling should be added thereto. In the case of material, this should include the wages of storekeepers and men engaged about storehouses in handling supplies; in the case of fuel, it should include the cost of loading, unloading into store, arranging, inspecting, watching, sawing and piling wood, and, finally, the expense incurred in preventing and putting out fires.

The wages of storekeepers and their assistants while engaged in handling and disbursing material and fuel should be charged to the accounts upon which they are engaged. When several accounts are affected, the amount should be apportioned among them at the end of the month on the basis of the amount of material charged each.

Each storekeeper should keep a record of his material account. At the beginning of the year he should debit the account with the amount on hand, as shown by his inventory; to this should be added the receipts during the month and the amount expended in the manufacture of material for stock. From the total should be deducted the amount of material disbursed and forwarded, the balance representing the material on hand at the end of the month. This balance should be carried forward to the next month's statement, and so on, until another inventory affords the basis for a new departure. The balance should be carefully scrutinized by the storekeeper, and any apparent discrepancies promptly investigated.

The storekeeper should send a statement of his material balance to the general accounting officer each month, who will compare it with the amount charged to him on the general books.

The diversity in the classes of material and the uses to which they are put, the differences in handling and accounting, together with the fact that officers of a company are not equally interested in or responsible for the different kinds, render it desirable to classify the material account. Thus, while all supplies that a company uses are embraced under the general head of Material, they are divided upon the general books under the headings "material" and "fuel," the latter being subdivided under the headings "coal" and "wood."*

While this classification is observed by the company upon its general books, storekeepers should effect a more minute subdivision of their material accounts, in order that any deficit or surplus occurring during a specified period may be placed where it belongs, and the accounts adjusted accordingly. Thus a separate record should be kept of the receipts and disbursements of the more important items of material, such as rails, ties, frogs and switches, track fastenings, lumber and timber, oil and waste, bar iron and steel, unfinished castings, wheels, and axles, blacksmith coal and coke, air brake fittings, stationery, dining car supplies, etc. The balance of a particular kind of material shown to be on hand at the end of the month should be verified from time to time by comparison with the actual stock on hand, thus obviating the necessity for large adjustments in the accounts when the regular inventory is taken.

All expense incurred in the manufacture of material for stock should be charged to the storekeeper in charge of same, under the heading "Manufactured Material." A separate account must be kept with each article or lot of material manufactured, so that the cost thereof may be accurately determined.

TRANSPORTATION CHARGES ON MATERIAL.

Freight charges on company's material received from foreign lines should not be way-billed forward to destination as advances. Such charges in each instance should be paid to the connecting line by the junction agent, and a receipt taken therefor in duplicate. At the close of the month the agent should send these receipts, together with a statement of bill-

* Blossburg coal, coke, etc., used in forges at shops by blacksmiths, coppersmiths, and others, should be charged to "material" when purchased, instead of "fuel," and should be treated in the accounts of storekeepers and others in the same manner as other supplies. One reason for classing such fuel with material is that the blanks for fuel returns are comparatively simple, as the number of accounts upon which fuel is used in the general operation of the road is very small. But fuel used at shops for the purposes indicated it may be necessary to charge to innumerable accounts. Hence it needs the same facilities and flexibility of bookkeeping that other material does.

ing, to the purchasing agent, requesting that a voucher be made to relieve his account of the amount paid.* These vouchers should be charged, when audited, to the material account of the purchasing agent, who will invoice the amounts to the storekeepers receiving the material.

Advances should be added to the original prices of the material (except when the freight is charged to the seller), so that when it is used it will be charged out at actual cost.

When construction material is way-billed with local charges, the receiving agent should deliver it, together with the freight bill, to the storekeeper, who should check it with the freight bill, and certify on the face thereof that he has received the property. After entering the details in his record book, the storekeeper should return the certified freight bill to the agent, who should, at the close of the month, send it, together with a statement of billing, to the freight auditor, with a request that his account be relieved of the amount. As soon as this has been done the papers should be forwarded to the storekeeper interested, who should immediately compare them with his records, and if correct enter the amount on his distribution book in the account "Vouchers chargeable to Storekeepers," after which the papers should be returned to the freight auditor for file. Such claims should be adjusted without delay, so that the agent may be credited and the proper accounts charged in the current month.

Construction material shipped from a local point to a point on a foreign road should be way-billed to the junction station with the foreign line with the local charges, if any, unpaid. The material should be delivered to the foreign road and the freight charges over that line prepaid to destination by the junction agent. He should take a receipt in duplicate for such payments and at the close of the month send them, together with a statement of billing, to the purchasing agent, with a request that his account be relieved of the amount paid. A voucher should be made by the purchasing agent and the amount invoiced to the storekeeper in the same manner as prescribed above for the handling of advances on material received from foreign lines. In the event such shipments should arrive at the junction with local charges, the agent should make a separate claim for relief of the amount, as provided for in the foregoing paragraph.

When construction material does not pass over a company's line, and is delivered at a point on another road, arrangements should be made, through the general accounting

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* This rule is necessary to enable the company to see that payment of freight is not made on goods that should be delivered free, or that payment is not made for a different amount than that deducted by the shipper from the invoice rendered by him.

officer, with the company delivering the material, to have its agent require the construction storekeeper, or his representative who receives the material, to certify to the fact on the face of the freight bill. The agent should then attach the freight bills to a draft on the general accounting officer of the debtor company, and remit it as directed by his company. When paid, these drafts should be charged to the construction storekeeper, and the freight bills sent to the purchasing agent, who should pass a voucher in his favor. The amount of the voucher should be invoiced to the construction storekeeper, to be taken up in his account.

All errors in way-billing material, corrections of weights, and mistakes of every nature, should so far as possible be rectified in the month in which they occur; and it is the duty of storekeepers and others to accelerate this work and make it as thorough as possible. Errors not corrected before the voucher for transportation charges is audited should be reported by the storekeeper to the freight auditor, so that reclamation may be made or correction otherwise effected on the books of the company.

All transportation or other charges on material consigned to a storehouse for contractors and others should be charged to them forthwith on the storekeeper's books, and a "various persons" bill made as in other cases. It is desirable, however, when practicable, that all material of this nature should be consigned directly to the party concerned, and that such party should settle the charges thereon with the agent; but where it is necessary to consign the material to a storekeeper, and charges thereon cannot be settled by the owner directly with the agent, it should be treated as above.

INVOICES.

An invoice is a statement or account accompanying or preceding the goods, containing a full description thereof, including quantity, price and other particulars necessary to be known by the person receiving the property. For the purpose of railway accounting, two kinds of invoices are used, viz.: an "invoice of material purchased"* and an "invoice of material transferred between storehouses."† The former is made by the person who sells goods to the company, and the latter by the storekeeper who sends supplies to another storehouse along the line, or to any person for use on account of the company. The "invoice of material purchased" specifies the name and address of the person of whom the goods are

* See Form No. 14, Appendix D.
† See Form No. 15, Appendix D.

bought; where the supplies are sent; particulars of the requisition under which they were purchased; date of shipment; description of articles, prices, items and total value thereof. The "invoice of material transferred" shows the place from whence the goods are forwarded; the point to which sent; requisition number; date of shipment; description of articles, prices, items and total value thereof.

The invoice is intended to afford the recipient a complete history of the shipment and description of the goods. The following specific rules and regulations govern its use:

An invoice of material purchased should accompany or precede each consignment of material bought; it is sent to the purchasing agent and by him forwarded to the storekeeper.

In order that invoices will be made in a uniform manner by the different firms from whom material is bought, the purchasing agent should furnish them with blanks for the purpose of making invoices (in triplicate) against the company. The original and triplicate of these should be sent to the official who is to take them into account, the duplicate being retained for a record in the office of the purchasing agent. When checking the material received any corrections necessary should be noted on both the original and triplicate. The original should be properly receipted and stamped in the month in which it will be taken into the accounts, and then promptly returned to the purchasing agent. The triplicates should be numbered consecutively, beginning with number one each month, and pasted in a scrap book, which will form the office record of "Material received from purchasing agent." The entry on the distribution of material book for "Material received from purchasing agent" need give the date, number of invoice, name of firm and amount only; the detailed items being omitted.

An invoice of material transferred should be sent for each shipment of material forwarded to storehouses, stations, section houses, offices and other places. It should be signed by the storekeeper, and forwarded by passenger train, accompanying or preceding the goods. The number of the car in which the goods are shipped should be stated; or, if shipped by baggage car, the fact should be stated.

When material is shipped to points where there is no storekeeper, an invoice should nevertheless be sent to the person who is to receive the material; it is required for use in inspecting and receiving; in such cases if the material is to be taken up on the books of another storekeeper, a duplicate invoice should be sent directly to him. The material should be charged forthwith to the account upon which it is to be ultimately expended, except when the disbursing storekeeper

can keep account of it subsequently, in which event he will charge it as used.

In invoicing material, the exact facts are required to be embodied; the quantity of material and the condition thereof should be accurately stated; the price should be neither more nor less than its cost as represented upon the books of the person making the invoice.

In order to obtain the necessary office record of material received and forwarded between storehouses without transcribing invoices, a particular blank is provided. It is so arranged that by the use of carbon sheets the forwarding storekeeper, when making the invoice, fills up, at the same writing, instructions to the agent to bill,* and his office record of material forwarded. The invoice he forwards (uncopied,) to the receiving storekeeper, who will take an impression of it in a tissue book, which constitutes his office record of material received from other storehouses. Invoices should be written in copying ink or indelible pencil.

Immediately on receipt of an invoice the extensions and footings should be carefully examined, and any variations, deficiencies, omissions or errors in quantity, quality, price, amount, or otherwise, should be clearly noted on the face of the invoice in red ink.

After the storekeeper is through with an invoice, he should receipt same, stamp on its face the month in which it is taken up on his distribution book, and return it forthwith to the sender. It is the duty of the latter to compare it with his record of material forwarded, noting thereon that the invoice has been returned, also any corrections that may have been made by the receiving storekeeper.

When material is transferred between shops or departments and it is found upon receipt that it will have to be returned on account of being damaged, not as ordered, or for any other cause, the invoice should be accepted and an invoice made for a corresponding amount when the material is returned. This rule, however, must not be interpreted to cover material received direct from the purchasing agent or outside shippers. Invoices for such material should not be accepted until all errors are satisfactorily adjusted.

Storekeepers should be particular to see that invoices of material forwarded near the time for closing the returns reach the shop or storehouse to which consigned before the storekeeper at such place has forwarded his distribution of material book.

In order to prevent delay in closing the accounts all material, transferred between storehouses or storekeepers after

* An invoice without the shipping instructions to station agents may be provided for use of storekeepers who do their own way-billing.

the 25th of the month, should be embraced in the succeeding month's accounts; the invoices in such cases, however, should not be dated ahead; storekeepers will understand, without this being done, that they are to be carried forward into the next month's account.

The forwarding storekeeper should stamp on the face of each invoice the month in which he will debit it on his books to the receiving storekeeper.

No charge, however, should be made on the distribution of material book against a storekeeper or other official until he has acknowledged (by signing and returning the invoice) the receipt of the material.

Each storekeeper is required to send on the 26th of each month to every other storekeeper to whom he has forwarded material, a statement of the total amount of the invoices charged the latter. If it agrees with the books of the receiving storekeeper the fact should be noted and the statement returned; if it does not agree the receiving storekeeper should immediately forward a detailed statement of the amount of each invoice entered by him; the forwarding storekeeper should compare this statement with his records and make the proper adjustment. Accounts must be made to agree in every instance before the distribution books are forwarded to the accounting officer.

In the event of delay in the receipt of invoices the receiving storekeeper should take the matter up with the proper person—either the purchasing agent or the forwarding storekeeper, as the case may be.

In case none of the material covered by an invoice of material transferred is received in time to check and enter the invoice in the current month's account, such invoice may be carried to the account of the following month, or until the material is received.

If part of the material invoiced has not been received at the close of the month, instead of carrying such invoice to the following month's account, it should be corrected by the receiving storekeeper to cover the material actually received and accepted for such amount. Upon receipt of the corrected invoice, the forwarding storekeeper will make a new invoice for the items carried over, and enter it in the next month's account. This will obviate the necessity of the forwarding storekeeper's carrying shipments of material in his account after a large part of it has been received by the consignee, and oftentimes disbursed.

The foregoing rule does not apply to invoices of material purchased, which should not be accepted until all the material invoiced has been received, or the matter otherwise adjusted.

Before receipting invoices of material purchased, storekeepers should see that any advances that may have been made for freight, or other purposes, chargeable against the seller, are noted on the invoice and deducted from the price of the goods.

Invoices should be carefully labeled and filed away for convenient reference.

Invoices should never be receipted without reference to the copy of the requisition.

When an invoice has been receipted, the fact and the date thereof should be noted on the copy of the requisition.

When shipping old material (scrap) to a storekeeper, a memorandum invoice, stating the details of shipment and describing the material, should be sent to him. Upon receipt of the material, the storekeeper should make invoices in duplicate, specifying correct weights and market value of the different kinds of material, sending the original to the forwarding storekeeper and retaining the duplicate for his record. The forwarding storekeeper should paste the invoices in their proper place in his record book of material forwarded.

THE PRICE LIST.

The price list should contain the cost of every article of material which is in stock.*

In writing up the price list, articles should be shown in alphabetical order, the name of the article first and description following. In addition to this it should be stated whether priced by the dozen, pound, gallon, etc.

The different sizes of similar material should be entered in regular order, beginning with the lowest number.

All invoices received should be compared with the price list and new prices entered under the month in which the material is received. When the price invoiced shows no change from the last entry, it will not be necessary to enter it again, but a check mark should be made, to show that the invoice has been compared with the price list, and that the price was the same as last entry.

All material embraced in the regular inventory should be priced at the prices current at the time the inventory is taken. These prices should be entered in the price list in the column provided for that purpose.

The cost of material manufactured at shops should be computed and the price entered in the price list, as in the case of other material.

Unusual or excessive fluctuations in prices should be in-

* Form 16, Appendix D.

vestigated and the amounts verified—both for material manufactured at shops and that received from other storekeepers.

In opening new price lists, the latest prices obtained on the different items of material should be entered in the new book in the column provided.

RECEIVING AND INSPECTING MATERIAL.

The duty of receiving and inspecting material is one of the most important that devolves upon the storekeeper and his assistants. Clerical skill and honesty in this respect, while absolutely essential, are not in themselves sufficient. In order to perform the work effectively the receiver must understand thoroughly the nature of material. Not only this—he must exercise also the greatest watchfulness to detect irregularities, omissions, errors or subterfuges. He must be sufficiently versed in clerical matters to be able to record accurately and clearly that which he observes, to note fully and perspicuously the details of each consignment, including the quantity, price and amount. The work that he performs affects not only the company, but the person from whom the material is bought; the latter is, in some respects, at the mercy of the storekeeper, and if he is unskilled, inexperienced or disposed to take unfair advantage, will, for the moment, suffer at his hands.

It is not the duty or office of the storekeeper to discriminate for or against that which he receives. It is his business to report the facts exactly as they occur; to state truthfully the nature of material, its condition and quantity, and to faithfully record the same upon his books. He must possess the confidence of the company, and, reasonably, of the seller. In order to do this he must be honest, experienced and capable. To the extent that he is deficient in any of these qualities he is lacking in usefulness.

In connection with the duty of inspecting material it may be assumed that there will be many and repeated efforts to deceive the company in regard to the quantity and quality of material sold and delivered to it. The manner in which deception will be sought to be practiced will vary according to surrounding circumstances, and the ingenuity of the seller. No specific rule can be laid down except that of unremitting vigilance. Efforts to deceive will not be advertised in advance. Every storekeeper should, therefore, at all times be on his guard and should approach the discharge of his duty in this respect with the utmost circumspection.

The following, among other necessary rules, should be specially observed:

Storekeepers should inspect material with the same care that they would if it belonged to themselves.

Breakages or defects of any kind, or variations from the specifications under which it was bought, should be noted and forthwith reported in writing to the proper official. Defective material should be kept apart, awaiting directions as to its disposition.

It will be understood in this connection that no greater latitude can be exercised in receiving material from storekeepers of the company than in receiving from merchants, although in the former case it is merely a transfer, while in the latter it is the receipt of new material the acceptance of which and the price to be paid, depend upon the inspection.

When the name of the manufacturer or seller is not plainly branded on the article, it is desirable that some mark should be placed thereon that will facilitate its identification afterward, in the event it should prove defective or otherwise than as agreed upon. In the case of round iron this may be done by painting the end or a portion thereof with some distinctive color. It will never be difficult for storekeepers to find some simple and effective way to mark material, so that no matter where it may be used afterward, it may be identified.

In receiving oils it is especially necessary to exercise the greatest care to see that they are up to the required standard. Samples of all oils received by purchase should be tested, unless otherwise directed, and a report of the quality thereof made to the storekeeper.

In the case of valve, car, engine and other oils, where the chemical analysis may not be conclusive, the quality of the article should be judged by actual use, and the observation and experience of those who handle it should be systematically sought to determine its character and worth.

It is in many cases impossible to determine by inspection, whether articles come up to the standard claimed for them, or not. An accurate account should be kept of the date of the receipt of such material, when put into use, time in use, conditions of use, and such other details as may be necessary to determine its character.

It is the duty of storekeepers and others, whenever necessary or practicable, to invite the advice of foremen and others having practical knowledge of material, so that the company may receive the benefit of their information and experience.

No material should be accepted until it is unloaded and inspected.

An accurate record of the number, condition and description of articles received should be entered in a tally book by the receiving foreman at the time the goods are unloaded.

The initials, number and seal record of the car in which

material is received should be shown in every instance. This is necessary for use in tracing shortages, locating responsibility for losses and damage, etc.

In receiving material it should be compared item by item with the copy of the requisition, a suitable notation or check mark being placed opposite each item of material received.

If only part of the material ordered is received, or if substitution of material other than that ordered is made, or if the material received is defective in any way, the facts should be noted in detail on the requisition, and the matter should be taken up with the proper person at once.

The invoices should be compared item by item with the record of material received (as noted on the copy of the requisition) and all differences noted indelibly on the invoice.

The copy of the requisition should be checked or marked in a manner to indicate that an invoice has been received for the goods, and duly signed and returned.

The copy of the requisition in addition to being a record of the material ordered, is a record of the material received and of the invoices accepted. By checking all invoices against the requisition the acceptance of duplicate invoices is automatically prevented. The requisition at all times affords a record of material due.

In receiving and inspecting material at points remote from a storehouse, it cannot be too particularly impressed upon foremen and others that the utmost care should be observed, as imposition is much more likely to be practiced under such circumstances than in other cases.*

As it is impossible that storekeepers should in all cases be able personally to receive material forwarded for delivery at points remote from their offices, they should require the foreman or other person who receives such material to make an accurate return thereof to them; and, as in some cases such material may not be accompanied by an invoice, the foreman should in such case embody the particulars connected with the receipt of the material in a memorandum or book, which he will submit at the close of the month to the storekeeper interested.

RAILS.—The inspection of these supplies should be as rigid as the circumstances will permit; but as this inspection in the first instance is largely superficial, it must be supplemented by careful and minute records of their duration and performance in practical use.

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* This has been especially noticed in the case of bridge and switch ties and timber delivered at points along the line, and it has been found necessary, in consequence, in some cases, to send an inspector to receive them as they are loaded for shipment, when not practicable in all cases to inspect them at the place of destination.

As a rule, material of this kind is bought under contract, stipulating that it shall last a certain length of time. A record should therefore be kept of the date rails are laid, from whom bought, when taken up, character of injury, etc., so that the contract under which they are bought may be enforced and the seller held to his agreement.

So far as practicable rails should be inspected when received. They must be carefully counted and their weight determined. They will not be treated in the accounts differently from other material; they should be invoiced when shipped and should be charged to the person to whom they are sent; they should not be included in any operating or construction account until used.

The cost of transportation of rails to point of delivery on the line of the company and the cost of inspecting and handling at general distributing points should be added to the price of the rails and included in the charge for same in the month the rails are put in the track.

When charging rails to repairs or renewals of track the credit for old rails taken up must be made coincidently; in the event the wear and tear of the latter is very great, allowance should be made therefor. In debiting rails to track the total value should be charged; the same rule should be observed as to credits, in the case of old rails taken up. When the credit received from scrap rail sold or forwarded is not the same as the amount at which the rail was credited when taken up, the difference should be charged or credited (as the case may be) to the proper account in the material distribution book at once, upon ascertaining the amount of such difference.

The great value of rails and the necessity of the management being constantly advised in regard to the quantity on hand, both old and new, suggested the form of monthly report appended for furnishing this information.* It shows the rails, both old and new, not in use, on hand at storehouses and along the line of road; it specifies the number of tons and lineal feet of each kind of rail. It is intended to be full, accurate and comprehensive, and should be made as of the last day of the month, and must be forwarded as directed.

The regulations governing old rails are provided for in connection with the scrap of the company.

In the case of rail mills operated by the company a separate account (under the heading "Manufactured Material") should be kept with each by the storekeeper in charge. The rail mill should be debited with all invoices accepted for rails sent to the mill; also with the expense incurred in handling,

* Form 17, Appendix D.

cutting, punching, etc. The account should be credited with the rails forwarded, and also with scrap sold. The price of the rails forwarded should be based on the actual cost of the work performed, and should be sufficient to cover the loss on account of scrap ends, etc. Upon taking the regular inventory, if there is a surplus or deficit in the account with the rail mill it should be adjusted in the distribution book, and the prices should be corrected in accordance therewith.

TIES.—The duties attending the inspection of ties are different from those in connection with other supplies and are conducted under much greater disadvantage; there is, moreover, a greater liability of the company being defrauded in the count and kind of material and in the sale of the same article to the company over and over again. Those who have charge of the duty of receiving and inspecting ties are therefore required to be men of fidelity and experience. They should be thorough in their methods, careful in the records they make and methodical in putting the mark of the company on all they buy.

The method of procuring ties varies upon different lines. Upon some they are delivered at points along the road; upon others they are delivered at some central point. The difficulties in handling those delivered along the line are greater than where they are received at a central point, and the labor of inspecting and the necessity of watchfulness also much greater. The measure of concern that should be exercised in each case should be commensurate with the work, and such as may be necessary to protect the company's interests absolutely.

The following rules and regulations in reference to the receipt and inspection of ties suggest themselves. They should be supplemented by such further measures as the circumstances of the case require:

In the inspection of ties each and every tie should be carefully examined and the returns made in accordance therewith.

To accomplish the work effectively, the ties should be inspected as delivered, or if piled in ranks should be removed, one by one, for examination.

Ties are purchased by agreement or special contract.

The ties that answer fully the specifications under which they are bought, as to quality, width of face, length, thickness, place of delivery, etc., should be piled together in tiers by the inspector as first class.

Those that do not come up to this standard, but are of good quality, suitable for sidings, or meet certain clearly de-

fined specifications, should be arranged in separate ranks; they are termed "culls."*

Ties not fit to be classed as culls should be wholly rejected and directions given for their removal by the owner.

The end of each tie accepted should be distinctively marked with paint, by the inspector, so that the same tie may not be submitted a second time for inspection.

A special mark should be used to designate ties which are to be sent to the tie-preserving plant for treatment.

An account should be kept with the ties at each place, namely, the number received; also those shipped or used.

It is sufficient to show in this account the number and kind of ties separately, without regard to valuation.

The storekeeper will, through these accounts, obtain a valuable check upon the business, necessary to verify the inventories and to correct errors or omissions in reporting the disposition of ties on the part of employes.

The return of the official whose duty it is to inspect the ties purchased should give: first, the name and address of the person from whom ties are purchased; second, the exact location of the ties on the road (viz.: the place, side of track, distance from track, etc.); third, the exact number of ties furnished of each quality, specifying the kind of wood by name; fourth, when both hard and soft wood ties are furnished by the same person, such ties should be separately enumerated and classified in the return.†

As payment for ties is based upon these returns, the greatest care should be exercised to insure correctness and reliability.

Each inspector should number the returns made by him, commencing with number one at the beginning of each fiscal year.

Returns of inspectors should be entered in a record book in detail in the order in which they are numbered, for preservation and convenient reference.

After inspection and acceptance, and not before, a voucher should be made.

The material should be debited, as in other cases, to the storekeeper in charge. When shipped away he should invoice them, as in the case of other material.

The following suggestions in regard to the purchase and delivery to the company of wood, ties, piles, lumber, etc., are based on practical knowledge.‡

* This is on the supposition that the buyer agrees under certain circumstances to accept "culls." If he does not, they should be rejected.

† See Form 20, Appendix D.

‡ I am indebted for them to H. E. Southwell, a gentleman of the highest probity and of long experience in such matters.

1. Contracts should expressly state in detail the kinds of wood that will be accepted; the various sizes, length, thickness and manufacture; the time and place of delivery; the manner of piling the same, in detail; the length and height of piles. Contracts should specify that each kind of material shall be piled in separate places on land designated by the company's agent at or above the grade of the railway track; that it shall be inspected and accepted by the company's agent, such inspection and acceptance being final and conclusive between the parties; that all material not accepted shall be taken from the company's ground on notice. It is the duty of the company's agent to designate the place of delivery and to watch the deliveries to know that the material bought is of the kind wanted, well manufactured and suitably piled, it being always understood that the seller will furnish as poor material as the inspector will accept, it being the aim of the former to make money out of his contract. A company should not allow poor material to be piled on its ground, but insist on the delivery of suitable material, well manufactured and well piled. A little care here will save much contention in the end.

2. The inspector stands between the contractor and the company. He should be a man well versed in the details of his business, have experience, knowledge and common sense. He should spare no time to get at the facts, honestly, and without prejudice between the parties, keeping accurate account of his work and making a report thereof to each party, being ready to verify the same by facts. The office of inspector or agent of the company is of importance and the incumbent should be a man of ability and integrity.

3. Every inspector should divide his territory for receiving material into sections, numbering them and making a diagram of the same. Each pile of wood, ties, or other material, should be marked on the diagram to show the place of delivery; it should be numbered and the number plainly marked thereon. The company's private mark should also be put in various places on the same, together with the date of inspection; also the length, height, etc., so that from the office record an order can be made for each and every pile of material on the track sufficiently accurate to enable trainmen to find the same.

4. Material should be charged to the storekeeper where and when received; he should have an invoice of each and every pile of material, showing the number, kind, amount, place, and when delivered. This description should correspond with the numbers on the pile. Material should be moved only on his order, and an accurate account should be kept by him of the same when moved. No material should

be allowed to be moved except on a written order and full returns thereof.

In those cases where sellers deliver freight at isolated places along the line, and also load the same for shipment, as frequently occurs in the case of bridge ties, switch ties and timber, it will be found advisable, as a rule, to send an agent of the company to inspect the property as it is loaded. The facilities for performing this work at the receiving place are not, in every case, adequate, and in the event a company does not have an agent on the ground to receive the property and see that it is shipped, deception may be practiced; in some cases the goods will not be delivered at all, in others there will be a deficiency in quality or count, the seller hoping to escape detection through the inability of the company to properly inspect the goods at the receiving point. The necessity of inspecting at the shipping point will not, of course, operate in those cases where the goods bought are forwarded to a person competent to receive and inspect them, but goods loaded by the seller to be delivered at bridges, culverts, sidings and other places along the line away from the inspection and care of storekeepers should, as a rule, be inspected and counted when loaded. There can then be no question, either as regards the delivery, quantity or quality, and all cause of misunderstanding or dispute will be avoided.

The cost of transportation of ties to point of delivery on the line of a company, the expense of any process of preservation and the cost of inspecting and handling at general distributing points should be added to the price of the ties and included in the charge for same in the month the ties are put into the track.

CARE OF MATERIAL.

Defects in arrangements for handling and storing material, dating back, in many instances, to the original construction of the road, prevent in many cases, its being handled economically or effectively. The remedying of these defects naturally enlists the attention and intelligent effort of all who are concerned in this department of the service. This interest should not be allowed to lag, and every advantage should be taken of the situation that experience and thought suggest.

In storing and caring for material the methods of merchants should be observed, namely, to place it so that it will be protected from misappropriation, so far as possible, and from damage by the weather, and at the same time be most convenient for receiving and disbursing. The necessity of arranging it so that the storekeeper may discover at a glance, as he passes through the storehouse and yards, material no

longer needed, or that is in excess of the demand or that falls short thereof, will naturally suggest itself to those in charge.

Method and order should characterize everything that is done about a storehouse.

In the care of supplies the necessity for special watchfulness in regard to particular articles of material will suggest itself to storekeepers. In many cases no danger of misappropriation attends the custody of articles, no matter where placed. This is so in regard to heavy castings, car wheels and kindred articles. They may therefore be left in the yards or in open sheds without danger, except to see that they are accounted for as used. In the case of many articles, however, great care should be exercised to prevent their being taken improperly, or used without the knowledge of the storekeeper. The particular articles that come in this category will suggest themselves to every storekeeper. They embrace, among others, oils, tools, brasses, articles of common use, hardware, etc. Secure provision should be made in such cases. Where it does not already exist it should be provided as soon as possible, as there can be neither economy nor wisdom in a condition of affairs that fails to protect the supplies of a company with all reasonable effectiveness against misappropriation, either casual or predatory.

In relation to much of the material disbursed, especially brasses, tools and implements of common use, the supervision of the storekeeper is expected to extend beyond the delivery of the article. He should watch over it, so far as he can, until it is no longer fit for use, or no longer needed, when it should be returned to him. In the performance of this duty all those who have supervision over employes, including the employes themselves, are expected to co-operate; indeed, it is mainly to them that the company must look, as storekeepers' duties in this connection are necessarily circumscribed.

It is the duty of storekeepers so far as possible to see that material is used for the purpose designated by those to whom it is delivered, and in the event it is not, to secure accurate and full returns thereof, so that no account may be charged with more than belongs to it, and the disbursements of the road may be accurately and properly apportioned.

The following specific rules should be observed in the care of material. They should be supplemented by all needful regulations wherever it is necessary; the purpose being, here as elsewhere, not so much to form a perfect code of rules, as to suggest, by giving those of a more salient nature, the others that are required:

The first thing that suggests itself as necessary in the care of material is to deny access to it to all not directly concerned

in its manipulation. Supplies should be placed, so far as possible, in a manner most likely to protect them from misappropriation and damage.

Approaches to material yards and storehouses should be restricted, and should, so far as possible, be under the immediate eye of those responsible for the material.

Every article should have a place assigned to it, so that its location may be accurately known, and access to it easy and systematic. The space allotted in each instance should be ample, so that it will not be necessary to divide the stock of any kind of material.

The storehouse should be divided into sections, each section being set aside for a particular class of material. The different sections may be designated by letters.

The different articles of material should be entered in the stock books in the order of their arrangement in the storehouse. The section in which each item is kept should be indicated in the stock books.

Racks should be provided, suitable for the purpose, for different kinds of sheet and bar iron and steel. They should be located conveniently for use and in such a manner that the quantity on hand can be determined at a glance.

Articles similar in appearance but differing in value and utility should be kept separate.

Oils, varnishes and other liquids should, if facilities allow, be kept in cans or tanks so arranged that they may be filled at the minimum cost, and from whence supplies may be taken as needed, without loss and at the lowest expense.

Dry paint and material such as emery, including powders of all kinds, should, if possible, be kept in bins.

Shelves should be so arranged that the contents of the various compartments may be ascertained at a glance.

Material that cannot be put in the storeroom should be placed in sheds; or if this is impossible, should be so arranged that only the minimum amount of damage will accrue from exposure.

Supplies should be arranged with a view to their use, those which are most frequently in demand being placed in the most accessible place for delivery.

Articles such as locks should be carefully tied in packages, so as to prevent the parts becoming separated.

Patterns should be arranged in order and catalogued, and so systematized that when one is removed a record of its disposition will be put in its place as a convenient reference and constant reminder of its absence.

Lumber and timber should be classified and piled with the care and method that is observed in lumber yards.

Material on hand for which there is no immediate use

should be promptly reported to the general storekeeper, who will order such disposition to be made thereof as may be advisable. In order that the location, kind and quantity of surplus material on hand along the road may not be overlooked, all storekeepers should be required to make a report to the purchasing agent and general storekeeper, showing all surplus material on hand on a specified date each month.* Upon receipt of requisitions for such material for use elsewhere, it may frequently be transferred with advantage from the point where it is not needed, instead of purchasing new material or filling the requisition from the general storehouse.

Storerooms should be kept clean and orderly, and such expedients and devices used as the best knowledge in regard to handling material suggests.

If the facilities are not adequate for the storage of coarser articles, such material should be concentrated in particular places as much as possible.

The place in which supplies are kept should be located as near as possible to those who use them, but the protection should in every case be such as to prevent material being taken except under authorized rules.

Such provision as is possible should be made for preventing fires, and for extinguishing them should they occur.

In the operation of business it will be necessary in many cases to forward material to isolated points on the road, either for particular or general purposes. In many cases it will be neither practicable nor desirable to charge such material to an expense or construction account when thus shipped. In such cases a separate account should be opened with each lot thus distributed, and frequent returns should be required from foremen and others in charge, of the uses made of it, quantity on hand, etc.

In the case of oils, storekeepers are required to exercise the utmost care, and to adopt every possible means that ingenuity suggests to prevent leakage, evaporation and loss.

Oil should be unloaded immediately on arrival and forthwith placed in the tank or other receptacle provided therefor. In the event there is no tank provided for its storage, or the amount received is greater than the capacity thereof, care should be taken, if possible, to see that the barrels are stored in a suitable place, so that the loss from evaporation and leakage may be reduced to the minimum.

Under no circumstances must oil be left in barrels exposed to the sun.

The greatest care should be taken to see that oil is not stored in proximity to combustible material, such as waste,

* Form 22, Appendix D.

etc. Danger from fire should be carefully guarded against at all times.

The person in charge of oil supplies, also those whose duty it is to fill lamps, lanterns, torches, etc., should be, so far as their duties in that direction are concerned, under the direction of the storekeeper, and he should be held responsible therefor.

Oil tanks should be cleaned thoroughly at least twice each year. In the case of lubricating oils this should be done in the spring and fall, at the time the change is made from winter oil to summer oil, and vice versa.

Illuminating oil should be carefully watched as disbursed, and in case impurities are detected in same the tanks should be thoroughly cleaned at once.

TOOLS, UTENSILS, IMPLEMENTS OF COMMON USE, BRASSES, PERSONAL PROPERTY, ETC.—The especial need of care in the storing and use of these articles, their value, and the fact that they are easily disposed of, or are of general use, adds to the difficulty of guarding them. The danger of loss after passing from the hands of the storekeeper is greater than when in his possession, as they are thereafter less carefully guarded, unless especial effort is made in this direction. The most feasible method of securing proper care that has been suggested is to require the possessor to return the old article in every case when a new one is needed to take its place. This system of exchange has been found to work admirably in the case of brasses, reducing the consumption thereof one-third. It should be enforced by storekeepers in every direction where it is practicable, in the case of tools and articles of common use in the hands of employes of a company. When a new article is required to be given out in exchange, the old one should be returned, or a satisfactory explanation given for not returning it.

In the event articles cannot be returned or accounted for, or they are injured through the neglect or carelessness of the employe, the official of the company immediately in charge should fix the amount of compensation, if any, to be paid by the delinquent.

So far as possible, articles of this nature should have the initials of the company ineffaceably stamped, branded or imprinted on them at the time they are purchased. This will furnish proof of the ownership of the articles in all cases of misappropriation.

In the event an employe who has property of a company in his possession leaves the service, it should be formally turned over to his successor and a receipt taken therefor, which latter should be forwarded to the storekeeper, so that he may transfer the charge on his books. This is the

plan that would be observed with a cash working fund; personal property is the same as cash to a company.

Property no longer required for use should be promptly returned to the storekeeper, and the charge upon the books canceled in accordance therewith.

Employes using tools, implements and utensils should be required, so far as possible, to order uniformly of a particular storekeeper.

Tools used at shops should be under the care of the storekeeper, or some person designated by him; he should, so far as practicable, distribute them in the morning and receive them back at night. Where the facilities allow, and the number of tools in use justifies the expedient, a place should be set apart for storing the tools, a compartment therein being assigned to each workman. When the tools are distributed originally to the men, a receipt should be taken therefor; on the return of the tools at night, this receipt should be given up to the employe; when the tools are required again in the morning the receipt should be delivered again to the storekeeper, or custodian of the tools, and placed by him in the compartment in lieu thereof, and so on.

Articles in use by trackmen, or by isolated gangs of men, should be in the care of the foreman thereof, whose duty it should be to see that every tool is accounted for, or the fact duly reported and adjusted.

Articles used at stations should be in the care of station agents.

Articles used on trains should be in the care of conductors.

In distributing brasses, tools and articles of common use, a duplicate of the receipt taken therefor should be retained by the person receiving the property, so that he may have accurate account of the articles charged to him.

Separate compartments should be provided for the storage of these supplies, or, if the supply does not warrant this, a cupboard, or other secure inclosure, should be made (especially in the case of brasses) which may be securely locked.

A special return and inventory of brasses is required to be made at the end of the month, showing the number of each kind on hand at the commencement of the month, the number received during the month and the number on hand at the end of the month.* It should also specify the number of old brasses shipped or sent away during the month, and the number on hand on the last day of the month.

The rules and regulations governing personal property in the hands of employes may be summarized as follows:

When personal property is given an employe or officer

* See Form No. 21, Appendix D.

for temporary use, a record of the fact should be kept by the storekeeper or official making the disbursement; it is his duty to see that the property is returned or duly accounted for when its use is no longer required. To enable him to do this intelligently he should keep a record book in which to enter transactions of this nature, giving in all cases the final disposition of the property. The material should be charged to the account upon which it is used when it passes into the possession of the employe; when returned it should be credited at its then cash value, to the account to which it was originally charged. The effect of this will be to bring it back into the material account of the company to the debit of the storekeeper into whose possession it passes. Thereafter it should be treated the same as other material.

DINING CAR SUPPLIES.—The great number of articles used in this branch of the service, and their especial value and adaptability to the needs of everyone, render it especially difficult to surround their care with adequate safeguards. They require to be guarded at all times with the same watchfulness and intelligence that a vendor of groceries displays in protecting his goods. Access to them should be forbidden except to those concerned in the handling of the goods. The account that is kept of them should be full and minute. When disbursed for use, account should be kept with each kind of material in detail. To render this easy and practicable, blanks are prepared containing a printed list of the articles used. Opposite each article the number or quantity delivered is noted. These blanks also explain the purpose for which particular articles have been used, the quantity on hand, etc. If these returns are duly examined and audited they will afford a very clear and authentic history of the use of the goods disbursed and of any inaccuracies that exist in connection therewith; in the latter case adequate explanation should be required; if not forthcoming the matter should be referred to the official in charge of the department for such action as the circumstances of the case warrant.

Storekeepers should open an account with each dining car.

Each conductor of a dining car is responsible for the utensils and supplies furnished his car. It is his duty to see that any breakages or losses that occur are reported to the official in charge of the department, who will fix the penalty, if any, therefor.

An order should be made by conductors for the supplies they require.* This order should be addressed to the storekeeper and should be certified by the superintendent in charge. It should show in detail all cooks' supplies, pantry

* Form 6, Appendix D.

supplies, liquors, cigars, chinaware, kitchen equipment, etc., on hand at the date of the last return; the number received since; the number used; the number returned to storeroom; the number destroyed or lost (with an explanation in each case); also, the number on hand. This return should be carefully compared with the previous return and afterward filed away for reference. At least once a month the return should be verified by personal inspection by the storekeeper.

The storekeeper is required to keep an account showing an itemized statement of linen furnished each car. At the close of each trip the conductor should deliver to him all soiled linen and receive in exchange therefor corresponding pieces of clean linen.

The quantity of linen on each car should be verified by the storekeeper at the close of each trip to see that it agrees with the articles charged on his books against the car.

When a dining car conductor or buffet porter is to be discharged or leaves the service, the general accounting officer should be advised in advance, so that if necessary a traveling auditor may be sent to audit the account. Any wages due such conductor or buffet porter should not be paid until his account has been audited and settled in full and all blanks and property belonging to the company properly accounted for.

METHOD OF TREATING THE DINING CAR SERVICE ACCOUNTS.—Collections on account of this service are not properly creditable to earnings. In many, perhaps the majority of cases, they are more than offset by debits. They may be called receipts, but not earnings. A proper disposition of them suggests that they be merged with the expenditures on account of this service, and the net amount closed annually into Operating Expenses under the account "Train Supplies and Expenses," if it represents a deficit; or into Miscellaneous Earnings, if it represents a profit.

In order to properly exploit the accounts, they should be kept by storekeepers under appropriate headings—such as those named below. Accordingly a separate account should be opened with each car under each head. Thus the receipts and expenditures of every car will be accurately known. At the close of the accounts thus severally classified, a recapitulation, showing the amount charged each car, should follow.

"DINING CAR SERVICE."—Under this head should be charged: (a) supplies for meals, including table waters; (b) wines, liquors and cigars (receipts from sales of bottles, barrels, and similar articles, should be credited against these items); (c) wages of conductors, cooks and waiters; (d) salaries and expenses of dining car superintendents, storekeepers, their clerks, inspectors and laborers, and such general office salaries and expenses as are incident to dining car service;

(e) fuel and water for cooking; (f) laundering; (g) shrinkage of supplies in storehouses; (h) miscellaneous expenditures, including cost of menu cards, tickets, stationery, flowers, lodging and board of crews, licenses, light, heat, soap, matches, polish, and other minor articles, and cleaning and lubricating cars.* The receipts from dining cars should be credited against the foregoing expenses.

"REPAIRS AND RENEWALS OF DINING CAR FIXTURES."—This account includes: (a) cost of *repairing* ranges, kitchen utensils, refrigerators, sideboards, tables, tea and coffee urns, buckets, and other analogous articles; (b) cost of *renewing* ranges, sideboards, tables, refrigerators, coffee urns and other similar fixtures; (c) cost of *renewing* glassware, silverware, crockery, cutlery, kitchen utensils and linen (table and servants'). Receipts from sale of second-hand articles should be credited under this item.

Any of the above expenditures which are common to two or more cars should be apportioned on the basis of the mileage of the individual cars.

Under the account "Repairs and Renewals of Passenger Cars" should be opened a sub-account, "REPAIRS AND RENEWALS OF DINING CARS" to which should be charged the cost of renewing and repairing dining cars, seats and chairs, and parts other than those enumerated under "Repairs and Renewals of Dining Car Fixtures."

The two first-mentioned sub-accounts, viz: "Dining Car Service" and "Repairs and Renewals of Dining Car Fixtures," should be closed annually into the account "Train Supplies and Expenses," if the sum of same indicates a deficit; or into "Miscellaneous Earnings," if it indicates a gain; and the third sub-account, "Repairs and Renewals of Dining Cars," should be closed annually into the account "Repairs and Renewals of Passenger Cars." Rent of dining cars should be entered and stated as a sub-account under the account "Hire of Equipment."

SCRAP.—The difficulties that attend the care of, and accounting for this class of material, are very great. They are embarrassing to the accountant because of the difficulty of ascertaining the exact quantity and price; only after it has reached some central place can the quantity be accurately determined. The storekeeper is thus delayed in bringing it upon his books.

Scattered along the road and about the yards or shops, it

* Oil used in lighting dining cars, and oil, waste and tallow used in lubricating dining cars, should be charged, when used, to "Train supplies and expenses." Afterwards, "Dining car service" should be charged with its proportion of the foregoing expenses on the basis of the relation that the mileage of dining cars bears to the total mileage of passenger cars.

especially invites the attention of those thievishly inclined. This fact should be kept in mind and every practicable measure taken to reduce the risk to the minimum. This will not be difficult if given due attention and systematically prosecuted.

It is intended to make the accounting in connection with scrap as exact and as comprehensive as in the case of new material.

Not only must the scrap be duly guarded, but it should be carefully assorted and re-assorted with a view to discovering any articles that may be used again, or that have a special value, and in order to classify it in such a manner as to secure the best price, which latter cannot be obtained if sold in the aggregate.

It is the duty of the purchasing agent to dispose, to the best advantage, of all scrap and material no longer of use to the company.

Notice of the sale or disposal of material should in every case be sent the local storekeeper in charge, so that he may duly account therefor in his returns.

In order that scrap may be collected at points most desirable for disposition and sale, it is the duty of the general storekeeper to designate such points. At those shops where scrap accumulates rapidly, bins should be provided and each class of scrap kept separate (see form of scrap report for classification).* When a car load of any particular kind has been collected the general storekeeper should be advised by letter. The latter will then procure sales order from the purchasing agent.

In the breaking up of bridges, buildings and other permanent structures, the material that is thought to be susceptible of further use, such as old timbers, lumber, ties and piling, should be carefully separated from that which is worthless and taken into stock with supplies of a like nature, but as such material deteriorates very fast and is often eventually destroyed, no value can be placed on it and no credit should consequently be allowed and therefore no charge should be made against the account on which it is again used. The foregoing must not be interpreted to cover usable or scrap iron and such material, on which a market value can always be obtained as scrap at least.

Storekeepers should keep a record book in which the daily accumulation of scrap should be entered, the amount being shown in detail; also the source from whence derived. This will enable proper credit to be given. Particulars of all scrap shipped away should be entered on this book.

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* Form 23, Appendix D.

Brass scrap requires to be especially guarded; it should be kept under lock and key and should be shipped in barrels or boxes whenever possible.

Old engine material should be collected by some person especially designated to perform that duty. He should weigh the same and designate the account to which credit should be given.

In order that due advice may be had of scrap on hand, a monthly return should be made to the general storekeeper of the quantity at the various storehouses.*

It is the duty of storekeepers to see that all old material is turned over to them as fast as it accumulates, in order that it may be duly accounted for on the books, while the facts are known, and loss or improper use thereof prevented.

The bulk of the scrap accumulates about the shops and along the track. The difficulty of collecting the former is not great, as it is restricted to narrow limits, and is, moreover, under the immediate eye of a storekeeper whose business it is to look after such matters. The disposition of old track material is more difficult and the liability to loss greater.†

In shipping scrap it will frequently occur that it will not be convenient for a particular storehouse or division to await the collection of a carload of old material. To prevent cars being only partially loaded, the accumulation of several depots should, if possible under such circumstances, be grouped together. The scrap should be invoiced to some local storekeeper, who should take it up on his books and add it to the scrap that has accumulated about his own storehouse; when there are no facilities for accurately weighing old material thus transferred, the weight may be estimated as in other cases and credit given on the basis of such estimate. In the final disposition of the scrap it should be invoiced to its destination, there to be reweighed and correct returns made to the shipper.

The method of forwarding scrap outlined in the foregoing rule will apply only in cases of partial carloads and is designed to avoid the added cost of shipping small lots, when by

*Form 23, Appendix D.

† The following method should be observed when a more convenient and practicable method does not suggest itself: "Each section foreman should have a platform for storing scrap picked up along the road. He will pick up every piece of scrap and put it on the pile at his tool house daily. Any article too large to be placed on his car he will remove on his dump car, or else have a way freight train stop long enough to permit him to load it. In this way the scattered scrap will be taken care of and saved from loss. Each month the roadmaster should start a car on some way freight train for the purpose of gathering up scrap at section foremen's houses and at depots, and ship it to some central point where it may be assorted, and such articles as are fit for use separated from the others; the latter being sent away, while the former are redistributed for use."—*H. G. Burt.*

bulking the accumulations of two or more storehouses full carloads may be secured.

When practicable, cars on their way to the shops to be repaired should be used in shipping scrap.

Old material, such as frogs, track tools, etc., which are sent to shops for repairs, should not be loaded with scrap.

The books, papers and records of a company should be kept so long as they may be useful or are needed to protect the interests of the company, or to elucidate the affairs of those who manage its interests. When no longer needed they should be forwarded (under the direction of the proper officer) to the general storehouse, and the purpose for which they are forwarded must be stated on the way-bill. The material thus received should be brought upon the books the same as other old material at its salable value; a full description of the same, including the name and address of the person from whom received, should be given in every case.

Scrap should be credited to the accounts to which it was charged as material in the first instance. Thus the value of old wheels or trucks removed from cars should be credited to the repair of the class of cars from which taken. If the particular thing from which the scrap accrues is not renewed or replaced (in other words, is abandoned, like a track taken up) the value of the scrap should be credited to construction or the thing originally charged. Thus, if a car is broken up and is not replaced, the scrap which accrues therefrom should be credited to rolling stock rather than to repairs. This rule is general in its application.

In reference to old rails and other scrap, it is the duty of the storekeeper to whom it is finally consigned to weigh each shipment and make return thereof to the person forwarding it; also to give due credit for the amount.

A weekly return should be made by the general storekeeper to the purchasing agent, giving the particulars of every car of old rails received by him, stating the number of car, date shipped, consignor, quantity, etc.*

No scrap should be sold or exchanged without being weighed in advance, or intelligent and proper measures being taken to secure accurate returns thereof.

In reference to the method of bringing scrap upon the books of a company, the most simple and economical plan that suggests itself is for the storekeeper to deduct the value thereof from his charge for the current month for new material disbursed; thus, scrap properly creditable to "repairs of freight cars" should be deducted from the charge for the month to that account, and so on. In this way by reducing

* See Form 24, Appendix D.

his credit the storekeeper will, in effect, be charging himself from month to month with the amount of scrap received by him, as only the net amount charged by him for current expenditures is credited by the accounting officer. In this way the value of the scrap will be brought upon the books without any special entry therefor.

In the event there is nothing chargeable against a particular thing for which there is a credit, an account may still be opened with it, and the amount of the credit duly posted thereunder. All credits for scrap and for other purposes should be entered in red ink, so that they may be readily distinguished from debits. Red ink figures should not be used on the distribution books except to denote credits.

Scrap, after being brought upon the books, should be treated in all respects the same as other material. For instance, if it is forwarded to another storehouse, it should be invoiced and charged in the same way as new material. Or if it is used for any purpose, it should be charged to the account upon which it is used, the same as if it were new.

The price at which scrap is to be entered on the books should be based on the current market rates for such old material. When this price is not known, application should be made through the general storekeeper for the rate.

In case the credit received by a storekeeper for scrap sold, forwarded to the general storehouse, or otherwise disposed of, is not the same as the amount at which it was charged to his account when received by him, the difference should be adjusted in his material distribution book at once, by charging or crediting the proper accounts therewith.

Each storekeeper should keep an account with scrap—charging it with the amount on hand as per last inventory, and with all credits allowed for scrap received. The account should be credited with the amounts received for scrap sold, forwarded or used. The balance should represent the amount charged to the storekeeper's account for material of this nature. It should be compared each month with the value of the scrap actually on hand and in transit (for which credit has not yet been received), and any surplus or deficit which may occur should be disposed of in the material distribution book, by crediting or charging the proper accounts with the amount thereof.

Storekeepers should consult with heads of shops and foremen in charge where scrap accumulates and use every precaution to see that no errors occur in keeping the record; that it is duly brought upon the books; is charged when used, sold or traded, and is invoiced as in other cases when shipped.

DISBURSING MATERIAL.

The duties and responsibilities of storekeepers in connection with the disbursement of material cannot be adequately defined by explicit rules. Some of these that occur as being fundamental are given here. Storekeepers should, however, supplement them by such further regulations as the necessities of the service require.

The storekeeper should see: first, that the documents upon which supplies are issued are authentic; second, that the persons to whom they are delivered are authorized to receive them; third, that the amount issued is reasonable and such as the use to which it is to be put requires.

In the event high priced or expensive articles are ordered for any particular purpose where cheaper material would do, the attention of the official in charge should be promptly called to the matter.

The storekeeper should take cognizance of everything connected with the handling and use of material; after its delivery by him it is his business to look after its proper use and safety, so far as practicable.

He should observe the purposes to which it is put and collect the remnants left in connection with every piece of work, or see that they are duly accounted for.

Whenever material is returned to a storehouse, the storekeeper should be advised of the account to which the credit for same should be given.

He should see that goods are accurately weighed or counted when disbursed, and, in order to facilitate easy delivery, they should be arranged with this view.

The quantity of material of each kind on hand should be adequate for the needs; a happy mean should be observed, avoiding extravagance on one hand, or undue risk on the other, by reducing the supply too low.

The good of the service requires that the storekeeper, in disbursing material, should exercise the utmost watchfulness and intelligence; that his work should be performed with methodical accuracy and promptness.

He should not only take cognizance at all times of the use to which material is to be put, but consider the probable needs in that direction.

Storekeepers and others in charge should be watchful and painstaking in accounting for labor performed for others and in the sale, loaning or exchange of a company's material, to see that no necessary regulation (whether forming a part of the rules of the company or not) is disregarded. The selling or loaning of a company's material, and the performance of work by its employes for other corporations or individuals

should never be permitted except on authority of the proper officer.

The storekeeper should see that material sold is charged, item by item, as delivered, and that the record thereof is maintained inviolate until finally reported to headquarters under the rules and regulations governing such matters.*

The practice of borrowing material should be confined to cases of emergency.

Storekeepers should charge material to the account upon which it is used, at the time it is used, even if no invoice has been received for it.

When it is necessary to disburse supplies at night or in the absence of the storekeeper, a capable and trustworthy person should be selected by him to perform the duty. But the storekeeper will remain responsible, as in other cases, for the proper performance of the duty.

In order that the disbursement of train and station supplies may be intelligently accomplished, storekeepers should open an account with each person to whom they are furnished, recording therein the dates and quantities of the supplies furnished. This will enable storekeepers to see that such orders are restricted within reasonable limits and that supplies are carefully and economically used. A similar rule should also be observed in connection with stationery, books, blanks, etc. Employes should order train and station supplies from a particular storekeeper; they should not change from one storekeeper to another.

Material delivered for use in a company's foundries should be accounted for by a person especially appointed for the purpose. Material should be issued by such person only upon orders properly signed. A debit and credit account should be kept by storekeepers with each foundry, charging them with the cost of material and labor used and crediting them with the product thereof. An account with a foundry should be of the same general nature as an account with articles in course of manufacture, described elsewhere.

When the nature of the work in paint and upholstery shops renders it necessary that a stock of material should be kept in such places, it will be the duty of the foreman in charge thereof to keep a record of the same, and report daily to the storekeeper the amount disbursed. A debit and credit

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* The same rule applies in regard to labor performed for others. Accurate account should be kept of it and charge made to the utmost farthing. It is not generally the policy of railroads to encourage the practice of performing labor at shops or elsewhere for others, nor to sell the material of the company; when exception is made to the rule, the utmost care should be observed to see that the person indebted is duly and properly charged.

account should be kept of such material to prevent neglect or improper use.

In disbursing material, that which is oldest or most likely to deteriorate should be used first. When the work will permit a second-hand or repaired article should be delivered rather than a new one, so that the company may obtain full benefit from such material.

In shipping material it is desirable to economize as much as possible in the use of cars. Thus, when material is shipped in small quantities it should, if practicable, be forwarded as way freight. Under ordinary circumstances material should be taken to the station and way-billed the same as other freight. If shipped in carloads it may be loaded directly at the storehouse, if facilities permit. Full particulars should in every case be given agents for billing.

Care should be exercised in loading material to render its unloading and inspection as easy as practicable.

All material should be plainly marked or tagged with the name and address of the person to whom shipped. Should way-bills become lost or separated from the cars, the mark or tag will identify the material and secure its being sent forward. The careful marking or tagging of material is especially necessary in cars going to different points, where the material is liable to be misappropriated. If it is impracticable to tag each article, a tag should be placed upon one of the articles, and should show the number of articles in the lot.

All material requiring it, should be weighed, and the weight entered by the person performing the work, on the request or order opposite the name of the article; the number of the car in which material is shipped should also be inserted thereon, and a distinguishing mark placed opposite the name of each article as it is loaded.

Cars containing company's material should be sealed and plainly marked by card, with their destination.

In disbursing oil especial care should be exercised to see that it is not extravagantly used; if for use on a locomotive, the amount delivered should not generally exceed the requirements of a round trip; if for use at a station, a month's supply should be the maximum amount furnished.

Local supply depots for lubricating cars, supplying trains, etc., should be limited to current needs.

Storekeepers are required to see that the supply of oil is restricted to the minimum, without transgressing the bounds of safety, so that by frequent and limited disbursement its use may be carefully scrutinized.

CLASSIFYING EXPENDITURES OF MATERIAL.—The charging of material to the thing upon which it is used is of the utmost importance. The great amount of material used and the

diversity of things upon which it is expended render a systematic classification of expenditures necessary, and unless this classification is governed by minute rules, the purpose of an expenditure can only be surmised, and all statements and accounts will be rendered practically valueless for purposes of comparison.

This last is of the greatest importance, as comparative statements form, in a measure, the basis of all reliable inquiry and investigation by railroads.

The classification, moreover, should be in sufficient detail to enable a management to fix responsibility upon those immediately responsible and afford at the same time an accurate and intelligent history of a company's affairs.

It should be so minute that the cost of a thing and the relative economy exercised may be analyzed and judged.

Furthermore, such subdivisions should be made of standard accounts as the enlightenment of officials and employes requires.

In opening accounts, the nature of the disbursement should be accurately indicated thereby; also the place or location of the expenditure. The details throughout should be so explicit that they have only to be studied in order that the scope and purpose of the expenditure may be accurately understood.

So far as the exigencies of accounts will permit, without undue expense, it is designed that everything that enters into the cost of a thing should be charged thereto. Thus, the cost of handling material, the outlay for the construction or repair of a building, platform, yard, fence, bridge, culvert, engine or car should so far as practicable be charged thereto. When, however, the expense of accounting is greatly increased by too minute a subdivision of expenses, and the value of the information thus obtained is not commensurate with the outlay, it should not be attempted.

Accounts should in every case be based on their value as a source of information and their necessity as a check; they are justifiable only so far as they are necessary; anything outside of this is wasteful and extravagant.*

In order to classify the expenses systematically and pre-

* It is the design of the system of accounts embodied herein, as explained elsewhere, to reduce the expense of accounting to the minimum; to make the primary clerical work necessary to be expended in compiling returns for labor and material answer the purposes of all the various offices, departments and branches of the service interested therein; to avoid duplication of clerical labor in the different offices and departments through which information flows; to afford the maximum amount of information at the minimum cost; to reduce the cost of accounting, in fact, to the last cent compatible with accuracy and permanency of record, and such classification of accounts as the interests of a company and the necessities of managers require.

serve a clear and permanent record of the same, distribution books are provided.* Accounts are to be opened in these for each expenditure having a separate identity in the classified list, such accounts being entered in their due order and sequence, care being taken in every case to use the designation prescribed by the rules governing the same.

In writing up the accounts, the record throughout should be so clear an exposition of the subject that it may be fully understood and analyzed without correspondence or further reference to the person making it. Thus, the items of each account should be given, including description of material disbursed, quantity or weight, price and amount for each separately; also the total cost or aggregate of all the items.

In giving the name of an account, especial care should be taken to make it so explicit and clear that it may be easily identified, and details of cost easily collected from the various books in which it is mentioned.

In classifying expenditures, it should be understood that the work is not to be performed at random in any instance, but according to preconceived rules and regulations; if the disposition of an expense is not known or not clearly indicated by an analogous account, information should be asked of the accounting officer; this will not only insure uniformity, but will also enable the company to supply omissions or correct inaccuracies in its classification.

In the majority of cases material and labor disbursed are chargeable to a particular thing. It will frequently occur, however, that the disbursement must be distributed among several accounts; this should be done according to the benefit derived. This division will be necessary in the case of the wages of storekeepers and their assistants, laborers employed upon general work about shops and others. Common expenditures of this nature require to be apportioned according to the specific benefit they confer. Thus, if for a given amount of labor or material a particular account derives benefit therefrom equal to sixty per cent. of the cost of such labor or material, and another account forty per cent., the apportionment between them should be on that basis. When the exact degree of benefit cannot be ascertained, the division should be such as is practicable and in harmony with the facts.† Specific reference may be made here to a few particular supplies. They will illustrate the whole. Thus, for Blossburg and fur-

* These distribution books are written up by the person who disburses the material, or in the office of the official to whom returns thereof are sent, as specifically directed in each case.

† Reference is not made here to expenditures to be divided between two or more divisions of a road, but to disbursements that affect two or more operating or construction accounts, which require to be apportioned among all accounts that have derived benefit therefrom.

nace coal and coke used at shops for various accounts, an estimate should be made of the amount used per hour by each furnace, forge or steam hammer, and the expenditure debited on such basis to the work in progress; when coal is used by a particular person it should, if possible, be prorated among the accounts upon which he is engaged, upon the basis of the time occupied by him.*

In attempting to apportion common expenses to particular engines, cars and other accounts, the most equitable basis, in the absence of definite instruction, should be used.

The foregoing will suffice in this place. The subject is so extended that it is impossible to do more than generalize. Expenditures are so variable that they cannot be named in detail. Provision should be made, based on the peculiar exigencies of the case. Only general principles can be laid down for the guidance of those who have charge of matters of this kind. Good sense, fairness and practicability must govern.

THE DISTRIBUTION OF MATERIAL BOOK.†—This book, like its prototype, the distribution of labor book, is written up on the ground by the person who receives, cares for and disburses the material.

It is at once simple, comprehensive and inexpensive.

It contains all the details, under specific heads, of material received and shipped away; also details, under classified heads, of material expended, and accounts with those to whom material is sold or traded. Finally, all the accounts are summarized and recapitulated at the close, so that they may be scanned at a glance, and the aggregate posted upon the general books at the headquarters of the company.

Before this book is sent forward by the person compiling it, the leaves should be arranged in proper order and an impression copy taken thereof, after which it should be bound in book form. The book is intended to be used finally as a journal voucher, to save cost of transcribing.

The questions attending the economical and proper use of material are of the greatest importance, and in order that they may be understood and intelligently studied, the accounts are so classified as to afford an accurate and intelligent digest of disbursements in the aggregate and in detail.

The distribution of material book should be written up from day to day as each expenditure occurs.

It is required to be sent to the general accounting officer by each storekeeper at the time specified after the close of the month. A distribution book is also returned by the pur-

* A debit and credit account should be kept at shops with coal and coke, in order the more accurately to determine the disposition thereof.

† Form 75, Appendix D.

chasing agent, embracing all material purchased by him and material invoiced by him to storekeepers; a distribution book is also rendered, in which is embodied a summary of the accounts spread upon the registers for vouchers and various persons' bills, etc.

In order that the method of writing up the distribution of material book shall be uniform, and that clearness shall be observed, and the utmost economy exercised consistent therewith, accounts should be opened in it in the order designated hereafter. They are intended to come in their natural order, and it is designed that the history of each shall be so clear and minute as to enable the officials of a company to understand fully each account without referring back to the person writing the book; this will not be difficult if care is displayed.

The accompanying rules and regulations, it is to be observed, are not intended to be exhaustive, but like others contained in this book, are designed rather to stimulate the ingenuity and skill of those interested than satisfy them with their completeness.

So far as rules are laid down they should be observed, but they are intended to be supplemented by minute appliances and devices that occur in the experience of each storekeeper, and that help to make his work simpler, clearer and cheaper.

Under the head of "material received" the date and amount of each invoice is to be given; also the name of the firm or storehouse from which the material was received.

In entering invoices the amount thereof should be given in the first money column of the book; only the aggregate amount of all invoices should be carried into the second money column.

The accounts to be kept in the distribution of material book are as follows, and should be opened in the order named:

MATERIAL RECEIVED FROM PURCHASING AGENT.—Under this head should be entered all invoices of material purchased, charged to the storekeeper rendering the book.

MATERIAL RECEIVED FROM STOREHOUSES.—Under this head should be entered all invoices of material received from the storehouses of a company, an account being opened with each storehouse from which material has been received.

MATERIAL FORWARDED TO STOREHOUSES.—Under this head should be entered all invoices of material forwarded to storehouses of a company, an account being opened with each storehouse to which material has been forwarded.

VOUCHERS CHARGEABLE TO STOREKEEPERS.—All vouchers that emanate from superintendents, civil engineers, storekeepers and others who keep a distribution of material book, will be charged to their material account by carrying the total of same to the final recapitulation under the head of "Material—

Vouchers" as a credit (red ink). The material account will receive credit by apportioning the vouchers on the distribution book to the accounts to which they should be charged.*

All vouchers entered on a distribution book should be stamped by the storekeeper.† This stamp will show the auditing officer that the storekeeper has entered the voucher, and will be his authority for charging the same to "Material—Vouchers" on his register, thus offsetting the credit given that account on the distribution books.

Following the foregoing, the accounts upon which material has been disbursed should be arranged in the following order: first, operating expense accounts in their order; second, construction accounts in their order; third, material manufactured by the company; fourth, coal; fifth, wood; sixth, various persons' accounts; seventh, miscellaneous accounts. Following these should be given the recapitulation of material received and forwarded, and the final recapitulation of the distribution book.

Under the operating or construction account to which a disbursement is chargeable, a sub-account should be opened for each bridge, culvert, viaduct, building, dock, wharf, ferry boat, locomotive, stock yard or dining car embodied in it.

A separate account should also be opened under the general head of "various persons' accounts," with each individual, firm or corporation against whom a charge has been made.

The total amount of bills should be carried to the final recapitulation under the head of "Material—Various Persons" as a debit (black ink) and the accounts that are entitled to credit should receive same. Each bill should be stamped by the storekeeper, as directed in the case of vouchers. This stamp is authority to the auditing officer to credit the bill to "Material—Various Persons" on his registry.

In order to distinguish the credit entries at a glance they should be made in red ink; if deductible from any account they should be made from the total thereof, only the balance being carried forward into the recapitulation.

In case the credit exceeds the debit, the credit should be carried into the recapitulation in red ink and deducted therefrom.

The amount to be entered as the total footing of the recapitulation, it will thus be seen, is the difference between the debits and credits.

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* Thus, if to pay for a cow killed, the amount would be entered as a credit under the head of "Vouchers chargeable to storekeepers;" and as a debit under the head of "Loss and Damage."

† ENTERED IN
July 19...
Storekeeper, Western Div.

OIL AND WASTE.—Oil and waste disbursed to be used in lubricating cars and machinery should, as a rule, be charged to the expense account at the time it is issued, in order to avoid the difficulty of accounting for it after it passes into the hands of car repairers and machinists.

Oil, waste and tallow for use on locomotives should be charged to the proper account in the distribution books when delivered to the engineers.

A separate blank is provided for the use of engineers in ordering supplies of this nature.* For convenience in accounting, the orders for the various kinds of oil and waste are printed on paper of different colors.

At the beginning of the month every engineer is given a book containing a supply of these orders. They are in the form of tickets or coupons, which are detached and given to the storekeeper when the supplies are received. Each ticket calls for a specified quantity of oil or waste, and all are numbered in order, so that the number on the first unused ticket in the book at the end of the month will designate the quantity used during the month. Thus the number of pints of each kind of oil and pounds of waste used by each engineer may be readily ascertained, for use in compiling statements showing the number of miles run per pint of oil and pound of waste by each engineer.†

When desired, a separate account may be kept of oil and waste used by each locomotive, for the purpose of determining the relative economy in this regard of various types of locomotives. In such event, the requisitions should show the locomotive chargeable with the supplies received.

STATIONERY AND PRINTING.—The multitudinous number of items embraced under this head, many of which amount only to the fractional part of a cent (when charged in detail, as the consumption occurs), together with the great expense that would attend any attempt to charge each item as consumed, renders it advisable to adopt a different method of accounting from that in force for other material.

The cheapest and simplest method that suggests itself is to charge disbursements of this kind as they are audited for payment directly to the items of expense that they affect, and at the end of the year charge or credit such accounts as the inventory (for this class of material) shows the balance to be over or under the amount on hand at the commencement of the year. This course should accordingly be followed, except in the case of stationery forwarded to shops, which should be

* Form 25, Appendix D.

† The preparation of exhibits of this nature and the great value to be derived therefrom are more fully treated of in the volume of the "Science of Railways" series relating to locomotive service.

invoiced the same as other material to the storekeeper thereof, and taken up by him on his books and distributed the same as other material.*

TRACK MATERIAL.—The conditions under which roadway and track material is stored and disbursed differ so greatly from other disbursements that different forms are required. In accounting for material at storehouses the returns are made by practiced accountants, while in the disbursement of track labor and material the returns are made by track foremen. The meager facilities that the latter possess render it necessary to simplify the methods employed as much as possible and reduce the labor connected therewith to the lowest possible point.

Each track foreman is required to make return of the labor he employs and the material he receives and disburses.

It is designed that these returns should be sent to some central office on each line or division (say, the superintendent's) to be there examined and aggregated.

The person who thus groups these accounts is termed the storekeeper: he is charged with all material that he makes return of, whether for track or for bridges and buildings, and receives credit for all that he disburses.

He is expected to make the same returns as other storekeepers. He also uses the same form of distribution book for labor and material that is used by storekeepers at shops.

The track material book used by track foremen, from which the storekeeper compiles his returns, is very simple; it is so arranged as to reduce the clerical work to the minimum and yet afford all the information that is necessary to a full and complete understanding of track work.†

The articles are printed in the book so that all the foreman has to do is to insert the quantity received, used and on hand opposite the name. The name of the account to which material is chargeable is also provided for, so that it does not need to be written in; all that it is necessary for him to do is to enter the amount of material consumed, under the proper head.

In the event, however, articles are expended upon objects outside of the track department, it is necessary to insert the name of the account.

The material book used by track foremen, like the track time book, contains all the directions necessary to be observed; it provides specifically for material received, mate-

* There is no objection, except the cost of accounting such method would involve, to treating stationery and petty station supplies the same as other material, i. e., charge it to operating expenses only when actually consumed.

† Appendix C.

rial expended on repairs of roadway and track and for rails and ties; also for construction of sidings, for material shipped away, and for material and tools on hand at the end of the month. It is complete and embraces all the accounts with which foremen are likely to have anything to do.

A ledger account should be kept in the superintendent's or storekeeper's office with each section foreman, showing the receipts and disbursements of the material carried in the "material" account. An account should be opened for each class of material, and it should be charged with the material furnished the section foreman each month and should be credited with the amount reported as used or shipped in his track material book.

The balance shown on the ledger should agree with the amount shown on hand in the section foreman's material book, and any discrepancy should be investigated at once.

Material shipped to a division for use in the track, also expenses incurred in repairing track tools for a division, should be invoiced to the storekeeper of such division. In the absence of instructions to the contrary, nothing is to be charged to track expenses except through the storekeepers in charge thereof.

FUEL.—The necessity of exercising the utmost intelligence and watchfulness in the care of the general supplies of a road to prevent their waste or misappropriation, suggests itself with redoubled force in connection with fuel.

The universal use of this article makes its proper protection exceedingly difficult. The theft of fuel from a particular station or train may not be great, but the aggregate thus filched is enormous unless the most painstaking and intelligent effort is made at all times to prevent it and to punish those who practice it.

The duties of the storekeeper in this direction are arduous and at all times unsatisfactory, because of the difficulty of enforcing necessary safeguards without incurring expense out of proportion, frequently, to the object attained.

These difficulties attending the care of fuel suggest the necessity of isolating it as far as possible and of preventing access to it of all except those who use it for the company; this is rendered less difficult than formerly on account of the appliances that have been introduced for storing and handling supplies of this nature, but until fuel (while in process of transportation and in store) can be placed under lock and key, the danger of its being stolen will be constant, and will need to be met with watchfulness on the part of those who have it in charge.

Fuel is the most difficult of all material to care for, and the magnitude of the sum involved (about one-eighth of

the expenses of a company) demands that the accounting connected therewith should be characterized by such intelligent and far-reaching methods as will secure the most satisfactory results.

The deterioration in quality of both wood and coal is continuous from the time it comes into the possession of a company until used. The extent of this deterioration depends largely on the manner in which it is stored; if exposed to the influence of the weather, deterioration will be marked and rapid. This fact should impress upon those who have charge of fuel the importance of keeping the supply on hand as small as is consistent with safety, and of exercising the greatest care possible in storing.

Not only should care be exercised to prevent misappropriation of fuel and its waste by improper care or unnecessary exposure, but every practicable device consistent with good business usage should be at all times enforced to secure the economical use thereof.

In furtherance of this purpose, careful comparisons should be made of the fuel used by different enginemen. Similar comparisons should be made of fuel used at stations, in cars, and elsewhere; wherever, in fact, conditions are similar, or the zeal of employes is likely to be increased thereby.

The following specific rules and regulations suggest themselves in connection with fuel. They do not cover the ground in detail, and are intended to be supplemented by those in charge with such further rules and regulations as the circumstances in each case require:

Two accounts should be kept by the company for fuel; one for coal and one for wood; charges should be made in accordance therewith.

Fuel stored at roundhouses and shops for use on locomotives and cars should be kept in the fuel account and, so far as the accounting is concerned, should be treated in the same manner as coal stored for like purposes at stations along the line; Blossburg coal, coke, etc., used in forges at shops by blacksmiths, coppersmiths and others, should be taken up on the stock book and distribution of material book, and should be treated thereafter the same as material, and so embodied in the returns.

Fuel should be charged with the first cost, the cost of transportation to the point of delivery on the line of the company (when there is any charge on such account), the cost of loading, unloading into store, arranging, inspecting and watching; the cost of sawing and piling wood; also the expense, if any, incurred in preventing and putting out fires.

Fuel brought forward from a preceding year, and appearing in the inventory for such year, should be charged, when

expended, like other material, at the price at which it appears in such inventory.

The cost of unloading fuel into chutes (for transfer to the tender) should be charged to "Fuel for Locomotives."

The following rules in reference to accounts should be observed:

Parties from whom coal is purchased should render the purchasing agent daily invoices of deliveries, showing date, car number, actual weight, where delivered, and the cost for each car of coal.

These invoices should be sent by the purchasing agent to the general storekeeper each day, to be by him compared with the statements of receipts rendered him by agents; afterward they should be entered in the fuel received book, signed and returned to the purchasing agent.

A statement should be required at the end of every month of all contractors who furnish coal; it should give the particulars furnished in the daily reports, and should embrace all coal delivered or shipped during the month; also the shipments brought forward from the preceding month and not accounted for in such month. The bill for coal should accompany this report.

To enable the general storekeeper to verify invoices, agents receiving company coal direct from contractors or connecting lines should report to him daily all such fuel received.* This report should specify the date of receipt, name of contractor delivering, initials and number of car. If the coal is weighed by the agent (and it should be where there are track scales) the weight as ascertained by him should be inserted; if not weighed by him, the weight as advised should be reported. The return should also specify the name of the station to which each car was forwarded and number of the way-bill covering the shipment.

At the end of the month a recapitulation of the coal received from each company should be made from these daily reports, and forwarded to the general storekeeper.

Agents at stations where coal is kept in store for future use or present distribution should make a detailed return to the general storekeeper of all company coal received or shipped by them each month.† It should show the date way-billed, way-bill number, initials and car number, weight of coal, kind (hard or soft), where from or to what place shipped. A separate account should be opened with each station to which fuel is forwarded, under which should be entered the details of all shipments to such station during the month. Each account should be footed and a recapitulation of these

* Form 29, Appendix D.
† Form 30, Appendix D.

amounts made, showing grand total of receipts and shipments of each kind of fuel.

Coal not actually received on the evening of the last day of the month should be carried forward into the succeeding month's bill.

In way-billing fuel, the quantity in tons or cords should in all cases be inserted so as to afford everyone interested the necessary data for making returns thereof and otherwise keeping the accounts correctly.

The monthly accounts returned by contractors should be verified by careful comparison with the daily and monthly returns made by agents. The correctness of these returns should in turn be confirmed by the monthly returns from other agents of coal received by them, by the amount of coal consumed at the point of delivery, and, finally, by the balance on hand at the point of delivery less the amount brought forward from the previous account.

The following rules and regulations should be observed in regard to wood:

All cord wood delivered by parties, for purchase, should be piled in conformity with the official specifications of the company.

After inspection, the number and length of the rank (pile) should be plainly marked with paint upon each end of the tier by the inspector.

The ends of several sticks in the rank (say three or four to each cord) should also be plainly marked with paint with the number of the rank.

Ranks should be numbered consecutively, commencing with No. 1 for each station.

At the time of inspection the inspector should note accurately in his record book: first, the name and address of the person delivering the wood; second, the exact location of the wood, i. e., the place, which side of the track and how far from the track; third, the number of the rank; fourth, the length, height and width of the rank, and the dockage, if any; fifth, the number of cords of wood in the rank; sixth, the kind of wood, as hard or soft, specifying it by name in each instance.

Fuel inspectors should make a return to the purchasing agent of wood measured by them; a duplicate of this should be sent to the general storekeeper to be used by him in verifying invoices for wood purchased, and in compiling the fuel record.* The fact that payment for wood is based upon these returns should insure the utmost care upon the part of inspectors.

The specifications under which wood is purchased should be critically complied with.

* Form 31, Appendix D.

If the rank is not of full height or not cut the full length, or not compactly piled as required by specifications, inspectors should take cognizance of such discrepancies, returning only the actual amount.

If the size, manufacture or quality of the wood is not fully up to the requirements, or if piled with intention to defraud the company, the owner should be compelled to assort the wood and repile it.

Agents at stations where wood is inspected should be made accountable for it after inspection. They should, therefore, be on hand at the time of inspection to verify it, generally, as to quantity, etc.

An account should be opened by the general storekeeper with each rank, in the form and manner described above for the inspector's report.

A fuel record book should be kept in which the reports of inspectors should be minutely transcribed before being placed on file. In this way clearness and continuity of statement would be assured.

When a rank or part of a rank is transferred, a report of the removal should forthwith be made to the general storekeeper by the person in charge. This report should specify the date of its removal, the number of the rank, or if only moved in part, what particular part was taken. It should also show the number of cords and the point to which shipped; these should agree with the way-billing.

To be able to render a correct account of wood sawed, it is of the utmost importance that a faithful account should be kept of the quantity of unsawed wood located at the different points on the line of the road.

Agents are, therefore, required to make a special report each month of the quantity of wood sawed at their several stations.

When the wood that is sawed is taken from the ranks, as originally inspected, the number of each rank and the amount sawed should be reported; when the whole rank is sawed in the same month the compensation of the wood sawyer should be based on the original measurement of the inspector.

When the wood is not arranged in ranks (as inspected) but is piled indiscriminately(as unloaded by the wood train gang) agents should make an approximate report of the quantity sawed. When the sawing is completed, if the whole amount on hand has been sawed, the amount that has been reported sawed should be deducted from the total amount on hand at the station; the balance will be the amount that should be embraced in the final report for wood sawed.

The actual amount of wood sawed should always be reported when the same can be ascertained.

Estimates should be made only for such quantities as cannot be definitely known until the completion of the work.

Seasonable notice should be given whenever wood located between stations is to be sawed, so that an agent or inspector may be on the ground to make a report of the quantity sawed, etc.

A voucher should be made by the general storekeeper (to be verified by the purchasing agent) in favor of wood sawyers for wood sawed by them; but the same must conform to the amount as shown by the record kept in the office of the former. Errors and inconsistencies must in every case be located and corrected before vouchers are passed for payment.

Where wood is located on the line at a point remote from stations it should be charged to the station most convenient to it, and the agent at that point should take it into his accounts and make returns for it when it is disbursed or moved away.

FUEL RETURNS.—Peculiar circumstances arise in connection with the accounting for fuel not noticeable in connection with other material. The latter is stored at a few central points under the charge of storekeepers who attend to its receipt, care and disbursement, and who make return of the same as described elsewhere. Their facilities for performing the work are easy, convenient and simple. The keeping of the fuel accounts, on the other hand, is performed by men, in most instances, who are occupied largely with other duties. The result is that the same thoroughness and accuracy is not observed in the one case as in the other. Moreover, fuel cannot be measured with the same accuracy as other material; this renders it still more difficult to secure satisfactory accounting.

The blank forms for reporting fuel are adapted to the particular circumstances under which such accounts are rendered, especial efforts being directed to their simplification; to make the work as light as possible and at the same time afford an accurate digest of fuel received and disbursed. It is not necessary to enter into any description here of the particular accounts that are to be opened of fuel disbursed on the general fuel report. They must harmonize with the list of operating and construction and other necessary accounts; in other words, the returns for fuel disbursed must be apportioned under proper headings, so that the recipient of these returns may from them charge the accounts upon which the fuel was expended, commencing with the operating accounts in their order and following on to the end.

It is designed that the general fuel report shall give the source from which the fuel is received and the quantities thereof.* This will require to be compared afterward by those who audit the fuel accounts, with the amount reported as for-

* Form 32, Appendix D.

warded to such place. In the event they do not agree (and in many instances they will not, because of the use of fuel en route and for other reasons) the occasion of the difference must be investigated and adjustments made in accordance with the circumstances of each case. On the credit or disbursement side of the general fuel report a statement of the amount of fuel disbursed is required to be entered. In order to do this with accuracy, the amount taken must be ascertained; this will involve the careful auditing of tickets and receipts taken from engineers and others for fuel delivered them; the fuel taken for use on trains and elsewhere must in like manner be ascertained from the receipts or other evidences of delivery. Each account upon which fuel is consumed must be stated. Afterward the amount shipped away, points to which shipped, quantity, etc., must be given.

The general fuel report is intended to afford a history of the fuel received and expended each month. The principle of the report is the same as that of the distribution of material book, except that it is simpler and of different form, the aggregate amount of each kind disbursed being given instead of each item.

In order to facilitate the keeping of an accurate account of fuel consumed by locomotives, and to simplify the work as much as possible, tickets are supplied to enginemen.* The tickets are in the shape of small coupons numbered consecutively and bound in book form, with a place for the engineer's name on the cover. Each coupon calls for one ton of coal, and the engineer detaches a coupon for each ton of coal received, writing the number of the engine and date of delivery on each coupon. At the end of the month the engineer returns the book with the unused coupons to the division master mechanic. The number on the first unused ticket indicates the quantity the engineer received during the month and is used in compiling the record of fuel consumed by each engineer, mileage made, work performed, etc.† The tickets he has issued are used in making the charge against the engine.

It is the duty of the person delivering coal to see that the tickets received correspond with the quantity delivered. Any attempt to procure fuel without the delivery of a ticket or receipt should be forthwith reported to the proper officer.

For fuel disbursed for other purposes a receipt should be taken in the absence of tickets being provided.

At the close of the day, the tickets received from engineers for fuel delivered to locomotives, should be counted

* Form 33, Appendix D.

†The preparation of these statistics and others in connection with the operation of locomotives is treated of more fully in the volume of the "Science of Railways" series relating to locomotive service.

and entered in the "Agent's monthly report of fuel delivered to locomotives."* At the end of the month, as soon as the tickets for the last day of the month are entered, the report should be footed, an impression copy taken of it for an office record, after which it should be forwarded, together with the tickets collected, to the storekeeper designated to receive same.

The storekeeper should audit the account, recapitulate the quantities of fuel delivered to locomotives during the month at the several fuel stations on his division, and forward this recapitulation to the general storekeeper.†

The aggregate quantity of fuel delivered to locomotives, as well as fuel used for other purposes, should be entered by the agent on the general fuel report, which, on completion, will be forwarded directly to the general storekeeper together with the receipts and tickets for fuel issued for other purposes.

It is made the duty of the general storekeeper finally to audit the returns for fuel. As soon as they are received by him they should be carefully scrutinized and verified, after which a summary will be made of fuel consumed, specifying the quantity of each kind issued, the price and value of same, entering the accounts chargeable therewith in their proper order. This statement should be forwarded to the general accounting officer for use in writing up the books. The foregoing returns are also required for use in compiling the locomotive reports and for other statistical purposes. The total quantity as shown on the summary should agree with the aggregate of the general fuel reports.

Any errors, inaccuracies or omissions found in the returns of fuel must be reported at once to the one in error by the person making the discovery.

STOCK YARDS.

The more diversified a company's affairs become, the greater the necessity for adopting devices to meet particular exigencies, preserving, however, the same general principles of accountability. The methods of handling freight receipts are such as are adapted to that particular branch of the service; the same is true in regard to passenger, express and mail business. Miscellaneous earnings require especial provision for different kinds of receipts, such as extra baggage, car service, etc. Another class of business to be provided for is that which arises at stock yards operated by the company. The measures necessary to be taken in connection with receipts thus arising are very simple.

* Form 34, Appendix D.
† Form 35, Appendix D.

Each stock yard foreman should keep a record book in which he should enter the particulars of stock fed at his yard and the charges connected therewith.* This record should show date, consignor, consignee, origin and destination of stock, way-bill number, date, car number, number and kind of stock, charges collected or to be entered on way-bill, and particulars of the seal record.

All supplies sent to the foreman of stock yards should be treated in the accounts the same as those handled at storehouses; thus the foreman should be charged with the feed supplied to him, also with all the incidental expenses incurred in connection with the stock yards, including the pay roll thereof. He should be credited with all supplies which he disburses.

Each stock yard foreman should make requisitions through his superior officer, on the purchasing agent, for feed and bedding as required.

If in case of emergency it becomes necessary for the foreman of the yard to buy feed, he should make a requisition covering the same, noting on its face the fact that the material has been bought, and should forward it, with the bill for the goods, through the same channel as he does his usual requisition. However, material should not be purchased in this way except in extreme cases.

The payment of incidental expenses at stock yards, such as shoeing horses, repairing wagons, harness, etc., should be made by vouchers, in favor of the persons to whom the amounts are due; these vouchers the foreman should certify to, and after they are spread upon his books and returns they should be forwarded in the usual channel for approval and payment.†

The foreman of the yards should be required to make a report of "supplies received and expenses incurred" to the general accounting officer on the first day of each month‡; it should include all expenses of the yard, viz.: feed purchased, bedding, tools, veterinary services, shoeing, incidental expenses and pay roll. It should specify the date, name of payee, description of the expense, quantity (if for feed), price and amount. The amount should be charged to the foreman of the yard.

This report answers the same purpose as the distribution of material book made by storekeepers.

The report of supplies received and expenses incurred should be accompanied by an inventory of supplies on hand at the end of the month.

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* Form 36, Appendix D.

† If not made by the foreman of the yard, they should be sent to him to enter and stamp, and should be charged to his account.

‡ Form 37, Appendix D.

A general time book should be kept by each foreman of the force he employs; it must be closed and sent forward to the proper officer on the first day of the month. Before sending it, however, the foreman should enter the amount on his "report of supplies received and expenses incurred," as already directed.

Material required in repairs, such as lumber, nails, hinges, etc., should, so far as possible, be ordered of storekeepers at a company's shops; tools requiring repairs should also be sent to the storekeeper, accompanied by an order to that effect.

All repairs at stock yards should be made by a company's force, as in other cases, so far as practicable, and all material needed should be furnished from a company's supplies so far as possible.

An invoice should be sent foremen for all supplies shipped them, or charges made against them.

STOCK YARD COLLECTIONS.—All charges due a company for feed, services or expenses, should be collected at the time or provision made on the way-bill for collecting elsewhere.

Each stock yard should be credited at headquarters of a company with all collections made on its account for feed, care and other purposes.

A record book should be kept by each foreman in which collections made by him should be entered, giving full particulars in each case.*

Each foreman should make a report of stock yards charges;† it should include all charges of every name and nature (without reference to who makes the collection), including those for feeding, sale of pelts and carcasses, and receipts from other sources. It should be sent to the general accounting officer on the first day of the month; it should show date of charge, whom the charge was against, what for, car number, quantity (if for feed), price and amount.

All collections at a yard must be turned over to the station agent on the day they are collected; or if this is not convenient other arrangements should be made.‡

INVENTORIES.

A yearly inventory of all a company's material on hand (not in use), including fuel and scrap, is required to be made; it is of the utmost importance.

It should be taken as of the last day of the fiscal year. Preparation should be made for it in advance, so that it may

* Form 38, Appendix D.

† Form 39, Appendix D.

‡ Amounts received or collected by agents on account of stock yards should be entered by them on their cash book and remitted with their other collections for the day.

be taken with celerity and accuracy. Nothing should be omitted.

The inventory affords the basis of a new departure, in that the amount charged on the general books to the respective storekeepers is made to harmonize with it.*

An important purpose intended to be accomplished by the inventory is to bring the whole question of stores on hand under the immediate eye and to the particular attention of every storekeeper, afresh.

If he has material in excess of his needs, or possesses articles for which he has no use, the fact should be communicated forthwith by him to the general storekeeper.

Storekeepers should not, however, wait until the end of the year to do this; they are expected to keep down the amount of material to the actual requirements of business and to notify the general storekeeper promptly in the event they have any surplus or if they have articles on hand for which there is not likely to be any further need.

If the amount of the inventory differs greatly from the amount charged to a storekeeper on the general books, it indicates a lack of method somewhere, either in caring for material or in charging it when disbursed. He is culpable in either event; he should exercise such method in his business as may be necessary to prevent any great deficiency or surplus.

It is not possible that the inventory should exactly balance with the amount charged to the storekeeper, on account of changes in prices and petty differences that are unavoidable in disbursing many kinds of material, but as these changes and differences are as likely to be one way as another, the books should vary but little in consequence.

Material or supplies that have been charged to an account and that are in course of being used, or that are awaiting use, should not be inventoried.

The inventory should be based on prices current at the time it is taken. When the prices are not known they should be obtained from the general storekeeper; the latter will obtain prices from the purchasing agent.

Inventories should be signed by storekeepers and sent forward after the close of the fiscal year, on the date designated.

Material in transit at the time of taking the inventory, accompanied by invoices bearing prior date, should be embraced in the inventory of the receiving storekeeper.

But as all material invoiced after the twenty-fifth of the

* Any deficiency or surplus is charged or credited at headquarters as the case requires, among the expense accounts to which material has been debited during the year on the basis of the amount that has been charged to each.

month between storekeepers is embraced as of the subsequent month, such material for the last month of the fiscal year should be embodied in the inventory of the storekeeper who forwards it, as it is not charged to the receiving storekeeper upon the general books of the company until the next year.

Material forwarded after having been inventoried should be invoiced as of subsequent date.

Material embraced in the inventory, when disbursed should be charged at the price inventoried.

Material or scrap charged in the books against a particular storekeeper should not be taken up in the inventory of any other storekeeper; in the event the storekeeper who should make return of it is likely to omit it from his inventory, the storekeeper cognizant of the fact should notify him of it.

In taking an inventory the work should commence at an initial point and be followed up in due order, taking all classes of material as they come.

The description of each article or class of articles entered on the inventory should be full and comprehensive; the price should also be stated.

Any exceptional circumstances in connection with an article or class of material, such as that it is in bad order, not needed, or has ceased to be usable, should be noted conspicuously on the inventory.

In case it is impossible to ascertain the actual weight or quantity of any kind of material or scrap, a careful estimate of the same may be made; the fact that the weight or quantity is estimated should, however, be noted on the inventory.

INVENTORYING.—Five days before the close of the fiscal year, if necessary, clerks and foremen at storehouses should be assigned sections of the storehouse, of which, with requisite assistance, they are expected to make an inventory. Each should be provided with scales (if needed) and a book, wherein the particulars of material on hand, as it is counted, may be jotted down. At the close of the day, and before going home, the entries on this book should be so arranged that they can be drawn therefrom onto the inventory blanks.

Material in course of manufacture, scattered about the shops, yards and elsewhere, should be inventoried and entered under that head. The value of such material should be the amount of the outlay made on account of same up to the time specified, less any credits which may have accrued therefrom.

Storekeepers should obtain from the heads of their respective shops such assistance as they may require to enable them to take the inventory promptly and accurately.

As fast as inventoried each article or class of material should be marked distinctively to show that it has been taken into account; this will prevent its being counted twice

and will lessen the embarrassment attending the disbursement of material during the time the inventory is being taken.

TRACK INVENTORY.—An inventory should be taken of track material on hand, in the middle of each fiscal year as well as at the end thereof.

It should not include any track material or tools actually in use.

Old tools and other property not in use having a marketable value should be embraced under the head of scrap.

The track inventory should include all rails, ties, iron, lumber, posts and other material belonging to a company on the line of the various divisions charged to the storekeeper making the inventory, no matter whether such material is to be used on the division where stored or is to be shipped elsewhere.

Track material at rail mills or en route thereto should be included in the inventory of the storekeeper in whose account such material is charged.

Articles should be enumerated separately in the track inventory, giving the quantity or weight, price and value of each.

The inventory of track material is not only intended to embrace that scattered along the line chargeable to the storekeeper thereof, but it should embrace all material charged to his account, no matter where located. Track material at shops in charge of storekeepers thereat should only be inventoried at the close of the year and should be embraced in the regular inventory for such storehouse.

Upon the completion of the half-yearly and yearly track inventory, a balance sheet should be made by the storekeeper in charge. In it the storekeeper should charge himself with the gross amount of the last inventory, also with such material as he may have received since, including scrap that has accumulated. Upon the other side of the account he should take credit for material that has been used, shipped away or sold. The difference between these represents the balance to his debit. If the balance harmonizes with the inventory that has just been taken no further action is required; but if it differs in any way, the storekeeper should make special entries on the material distribution book, increasing or diminishing the amount of track material charged in the month just closed by the amount of such difference. In thus adding to or deducting from the charge of rails, ties or miscellaneous track material (so as to make the accounts harmonize with the balance on hand), the differences should be added to or deducted from the account particularly affected, namely, renewals of rails, renewals of ties, or repairs of roadway. An explanation of the differences thus adjusted should also be

made on the distribution book, showing whether caused by changes in prices or otherwise.

Only the aggregate quantity or weight of each article of track material, with the price and value thereof, for the whole territory under the storekeeper need be embraced in the inventory. The storekeeper should balance the articles expended and on hand with those he has received; thus, the number of frogs on hand, as per inventory, should be the balance remaining after charging the number brought over from the previous inventory, with all additions since that time, less the number used and shipped away. Other articles should be treated in the same way.

STATIONERY INVENTORY.—A separate inventory should be taken for stationery, so that any surplus or deficit that may arise in connection with this kind of material may be credited or charged to the specific accounts affected.

DINING CAR SUPPLIES.—A separate inventory should also be taken for dining car supplies, so that any surplus or deficit that may arise in connection with this kind of material may in like manner be credited or charged to the specific accounts affected.

An inventory should be taken of the supplies of each dining car as often as once a month.

An inventory should, moreover, be taken of the linen in each dining car at the end of each trip; first of the unsoiled articles, afterwards of those that have been used; the latter should be turned over to the storekeeper or person designated to receive it, and will serve at once as an inventory and a record against the laundry.

CLOSING STOREHOUSES.—An inventory is required to be taken whenever a storehouse or construction or other supply depot is closed.

STOCK YARDS INVENTORY.—A separate inventory should be made for supplies at stock yards, so that this particular branch of the business may be credited with any surplus or debited with any deficiency that arises in connection with it.

FUEL.—Separate inventories are required for coal and wood respectively.*

It is the duty of the general storekeeper, by whom the details of fuel received, on hand, and disbursed are kept, to take charge of the inventory and to furnish instructions, blanks, etc. The inventory should be taken as in other cases, and should give in detail each class of fuel, its price

* Fuel at shops and roundhouses for use of blacksmiths, tinsmiths, boiler-makers and kindred purposes, is intended to be embraced in the inventory of material; the inventory of fuel is intended to embrace all other fuel. All the inventories of the company are finally consolidated at the general office under the three heads into which the material accounts are divided, namely: "Material," "Fuel-Wood" and "Fuel-Coal."

and the total value thereof. This report should be forwarded on the date required after the close of the fiscal year.

At stations where fuel is delivered to locomotives an inventory should be taken at the close of each month.

These inventories should be taken by the agents at the stations where the fuel is located, but at certain points, to be designated by the general storekeeper, division superintendents should delegate representatives whose business it is to examine into the facts of the case and see that the inventory is correct, and certify thereto.

The same rule should be observed in regard to the inventory for fuel that is required in other instances, namely, that the description shall be accurate and such as to enable those in charge to determine the quantity, kind and condition.

In the event fuel is found to be in bad order, or not relatively up to the standard, a separate item should be made of it in the inventory.

As soon as returns have been received of fuel on hand, they should be recapitulated by divisions, showing the amounts on hand at each fuel station upon the road; afterward the amount on hand upon the whole road. The whole should be certified by the general storekeeper to the accounting officer. After the value of the fuel on hand has been thus ascertained, the amount standing to the debit of fuel on the general books will be made to harmonize therewith by charging or crediting (as the case requires) the expense accounts to which fuel has been charged during the year on the basis that the amount charged to each bears to the whole.

[NOTE.—For method of handling material and keeping account thereof proposed by the standing committee on disbursements of the Association of American Railway Accounting Officers under date of May 1, 1892, see Appendix A hereto. The method it proposes agrees substantially with the foregoing, which I introduced first in 1869.]

CHAPTER XXV.

LABOR—PRACTICES GOVERNING THOSE WHO EMPLOY LABOR OR WHO KEEP THE TIME OF, OR ACCOUNT FOR, THE LABOR OF EMPLOYES.

Before taking up specific regulations necessary in handling the labor of a great corporation, it will be well to inquire, briefly, into the theory of the subject. By such a course we will be able to understand the subject better and better fit ourselves to judge of it in detail.*

The amount that a railroad expends for labor is so great that the rendering of accurate returns in connection therewith, including the making of true and faithful pay rolls, is a matter of the utmost importance.

Wherever men are engaged, whether at shops, roundhouses, yards, warehouses, storehouses, depots of supply, upon the track, at stations, upon trains, or at any other place, intelligent provision must be made for keeping accurate account of the time they work, whether the work is done by the hour, day, month or piece. Otherwise it cannot but follow that injustice will result, either to the employe or to the company.

It must be remembered, moreover, in this connection, that any neglect to keep the time of men clearly and accurately involves something far beyond the amount a company may lose through particular errors or omissions. It means the demoralization of the force; it means dissatisfaction with a company, if an employe loses through negligent methods; it means the building up of an improper spirit if he gains something that does not belong to him.

In order to keep the time of men accurately, the clerical labor connected therewith should be performed by a person on the ground, who notes the time worked from day to day as it occurs. Afterward these details are consolidated and the wages computed. Whoever keeps the time is, generally speaking, the most fit person to make the pay roll. Practices, however, will not be uniform in this regard.

Those who have charge of labor accounts, including those

* The attention of the reader is respectfully called to what is said in the chapter devoted to the general rules governing the care of material and the accounting connected therewith. Its perusal will aid to a better understanding of the chapter on Labor accounts.

who keep the time of employes, by performing their duty faithfully, may protect a company's interest in various ways: first, by preventing the introduction or growth of irregular or improper practices; second, by affording the management accurate information of the extent and purpose of expenditures for labor, and the measure of economy that has characterized such expenditures.

The number of employes, the diversity of work in which they are engaged, and the extent of territory over which they are scattered, render the duty of keeping their time a work of extreme difficulty, requiring the exercise of skill, fidelity and patience. The same causes render it difficult to obtain an authentic distribution of labor, i. e., an account of the thing upon which the labor is expended.

To attain these important and necessary objects, various devices, blanks, books and accounts are provided: first, for taking the time; second, for computing the same in dollars and cents, and third, for rendering an accurate and classified return thereof.

Methods for keeping the time of employes should be especially designed to secure them justice; to insure their being paid all they earn; to prevent their losing, either purposely or otherwise, a moment that they have worked. At the same time methods should be such as to protect the company against laxity or unfair advantage. In order to secure this double purpose, it is essential that the time men work should be kept with the utmost punctuality, and should be governed by arbitrary rules; that timekeepers should know exactly their duties and should perform them intelligently and without hindrance from anyone. In this way a company will know every person who works for it, how long he works, the rate he receives, the amount due him, and upon what he works, while the employe will receive the utmost farthing that is his due.

The securing of these objects requires watchfulness, fidelity, experience and accuracy.

In reference to time worked, the employe, being personally on the ground, looks out for himself. The company, on the other hand, is compelled to look to the timekeeper and the officials in charge to protect its interests. Their responsibilities, therefore, call for indefatigable watchfulness and the exercise of skill and integrity of purpose.

Those who have charge of the time of employes should make prompt and full returns thereof. At the same time they must be upheld in the exercise of the prerogatives of their office. The office must not be made an appendage to something greater or entirely foreign to it. Its occupant must be especially skilled in his duty, and must be able to go

ahead untrammeled in the performance of it; everyone should co-operate with him therein in every proper and reasonable way. Any attempt to evade or obstruct his work cannot be too severely censured. But while this respect and co-operation must be extended to him by officials and others, it is the duty of those responsible for the employment of labor to see, by inspection and otherwise, that every timekeeper performs his work promptly, accurately and faithfully; that he enforces every proper safeguard necessary to insure the keeping of the time correctly, and the rendering of true returns therefor; that he is scrupulous to see that the instructions of a company are complied with; that the rate of wages allowed by him is such as has been agreed upon; that the time allowed is in accordance with the facts, so far as correct methods of accounting can secure this; that while observing the instructions and interests of a company he is careful not to take advantage of his office to do injustice to any employe, either personally or otherwise. In this last named respect the timekeeper should keep constantly in mind that the interests of the employe and the company are identical, that one cannot be harmed without injury to the other, and that there is not, and cannot be, any real antagonism between them.

In order so far as possible to insure accuracy and concurrence of knowledge, pay accounts should be certified to by all who are personally conversant with the facts they recount. And it should be remembered, in this connection, that the certification of two or more disinterested persons, conversant with the facts, is a higher evidence of the correctness of a pay roll than the certification of any number of people who have only a general knowledge of the matter they subscribe to. It is impossible that the higher officials of a company, especially those having general, supervision of its affairs, should know the particulars of the pay roll from month to month. But the foremen and timekeepers know these details; the latter the name of each man and the number of hours he has worked; the former whether the men whose names as entered really worked for the company or not, the rate they should receive and, generally, how long they worked. The foreman, therefore, as well as the timekeeper, should certify to the correctness of the returns for the forces under him. His doing so will reduce to the minimum the likelihood of improper practices or errors.

The principle to be observed in rendering accounts of labor is the same as that observed in other financial transactions of a corporation. Each account should be certified to by at least two independent persons in order to establish its validity. Thus, the certification of an agent or foreman will substanti-

ate the return of a timekeeper. This rule of verification should be carried to its utmost limit. After the local officials have certified to the returns, the returns should pass on to the higher official in general charge of the work. He may not know all the details, but he is familiar with the general circumstances of the case, and whether the time returned has been authorized; also the objects upon which it has been expended. His certification, therefore, will be specific assurance that the returns are authorized, and are generally faithful and accurate. From this official the returns will pass on in due sequence to the next higher official, and so forward until they reach the officer whose duty it is to approve for payment.

The immediate duty of keeping the time and wages of employes, and the distribution thereof, should be intrusted to persons especially delegated to perform the duty. Where the amount of work at any particular point justifies it, a timekeeper should be designated, whose especial duty it should be to look after this branch of the service.

At shops and storehouses this official may also be intrusted with the duty of receiving, inspecting, caring for and distributing material. This aggregation of work will permit of greater economy than would otherwise be possible. For convenience I designate him a "storekeeper." When, therefore, reference is made herein to a timekeeper, it will be understood to mean the employe in question.

In many cases the clerical work is so great that it necessitates the employment of clerks to take the time of employes and otherwise to assist. When this is so, their certification to the accounts should also be attached, as well as that of the storekeeper in charge; but they should be subordinate to and act under the direction of the latter.

At stations, the duty of keeping account of the time and rendering returns therefor is generally intrusted to the agent.

For employes engaged on the line, erecting bridges, buildings and fences, repairing the track, or otherwise employed, the foreman in charge should render account of the time and certify thereto.

Conductors should keep account of the time of train forces and render returns thereof.

At isolated points or places of the road, the official or person immediately in charge is necessarily held responsible for accurate returns of time worked and wages due therefor; returns are rendered by him.

The duty of keeping the account of time worked and rendering returns thereof should, in every case, devolve on an official on the ground, conversant with the facts. It should be his duty to enforce the rules and regulations governing

such matters. In the event they are inadequate in any respect he should supplement them by needed regulations.*

In some cases the pay roll is made at the headquarters of a company; in others by local officials, who keep the time and are conversant with its details. The latter plan is for some reasons to be commended, as it affords those who are responsible for the employment of labor opportunity to retain the accounts in their offices longer than they otherwise would for examination, at a time when the information is of the greatest value to a company.

The possession of the pay roll by local officials also enables them to certify to its correctness upon its face, thus giving it an additional stamp of authenticity.

Not only is it well to require the pay roll to be made by local officials, but it should pass, in due sequence, on its way to the paymaster, through the hands of all who are in any way concerned in it.

Not only this, but the details (distribution) of each man's time should also pass through the hands of the local officials. In this way every person having anything to do with the roll, or who is in any way responsible for it, will be afforded the benefit of all the information it contains promptly, accurately and concisely. This information is of the greatest value to officers, and greatly heightens their usefulness.

All returns connected with the disbursement of labor should, so far as practicable, pass from the person who compiles them, through the offices of the various officials responsible for the employment of labor, to the officer designated to finally receive and store them at headquarters. In this way the expense of an embryo accounting department in each official's office is avoided, as they may severally make such record of the returns passing through their hands as is needed for use and reference. In the event they wish the details of an account at any time, it is to be found in the office where the returns were first compiled or in the department where finally lodged.

In the absence, therefore, of instructions to the contrary, the pay roll should, in every case, be made in the office where the time book is kept; or, in the event the pay roll is made by consolidating two or more time books, then in the office where such consolidation occurs.

Still other benefits are secured by requiring the pay roll to be made where the labor is performed by those who keep the time, viz.: it insures the work being done by competent persons, familiar with the facts and having all the sources of information at hand for use or reference; it affords, as already suggested, the officials immediately responsible for the work

* Of which due notice should be sent to the proper officer.

more time to inspect the accounts than would otherwise be possible; moreover, the roll being made at the initial point, follows, in due sequence, the route of procedure and responsibility on its way to the paymaster. Thus, every safeguard possible is made use of to secure clerical accuracy, while affording the officials interested in the labor accounts the best opportunity possible to inspect them.*

Each shop roll should be made by the timekeeper thereof, and should include all subsidiary forces that come within his cognizance. The pay roll for the station force, track force, bridge and building force, and other distinct departments of labor, or isolated gangs, should be made by the official immediately responsible therefor, to whom the time books are sent by those who compile them.

This division of labor, while in all respects the most economical that can be devised, affords operating officers an opportunity to acquaint themselves with the labor accounts of their several departments. But their examinations should be carried forward with celerity, so as not to delay auditing the accounts or the payment of the roll. No one into whose hands a roll passes should retain possession of it beyond a specified time—say six hours.†

In keeping account of the time and wages of men and the distribution thereof, it is apparent that the forms and devices used must adapt themselves to the peculiar circumstances of the case, to the number of men, the place where employed, the kind of work, and the facilities for keeping accounts. The elaborate devices that are necessary at a great shop or other spot where an army of men is employed are not necessary where only a small force is engaged. In one case a timekeeper is required to keep the accounts; in the other the keeping of the time is a mere incident. The forms used must also be adapted to the nature of the work; thus, at shops and elsewhere where machinists and carpenters are engaged, the multiplicity of things upon which they work requires the use of more comprehensive forms to distribute

* Many roads make their rolls at headquarters. The practice has many things to commend it. Who shall say definitely it is not the best?

† In reference to the plan of making the pay roll where the time is kept: There can be no objection, it is apparent, to making it at the general office, except the more limited facility such practice affords operating officers to familiarize themselves with its details, and the additional expense that such concentration of work in one office, at a particular time in the month, would possibly involve. By apportioning the duty among many offices, the work is not believed to be felt materially, and may be pursued leisurely and with due reference to the mechanical and critical skill required in its performance. Moreover, the roll itself, passing afterward under the eye and receiving the certification of those familiar with it, must receive more general and careful scrutiny than would be possible under circumstances less favorable.

the labor under proper heads than at stations, yards, warehouses and water tanks, where the wages are in the main charged wholly to a particular account. In providing a form its particular use has, therefore, always to be considered. This is especially noticeable in connection with the time books used by track and building gangs; the facilities they enjoy for performing clerical work are very meager at best; the blanks they use, therefore, must be such as are easily handled and easily understood. Matters of this nature require always to be remembered and observed, as any neglect to do so will occasion unnecessary outlay, and will greatly harass those who have the work to perform, and prevent its being conducted with efficiency.

Such is, briefly, a hurried outline of labor accounts. Let us now take up the subject in detail.

MANNER OF TAKING TIME.—In order to secure accuracy in the keeping of time of employes and to prevent errors and omissions, the following specific rules should be observed.

When the time of a large number of men is to be taken, a check room should be arranged for use by the timekeeper.

In order to facilitate the distribution of checks, and for other purposes, a check board should be prepared for use of the timekeeper. This checkboard should be divided into squares, each square being numbered, commencing with No. 1; on these squares should be hung metal checks, corresponding with them in number; checks not in use should be turned face down on the board.*

In order to prevent confusion or possible loss, arrangements should be made for locking the check rooms and for preventing access to them by unauthorized persons.

The person whose duty it is to check the men in should be in his place fifteen minutes before the commencement of work.

At shops and other places where a large number of men are employed, they should be checked in before going to work in the morning and again in the afternoon.

Each man should be designated by a number.

Separate checks should be prepared, those for the forenoon being marked "A. M.," and those for the afternoon "P. M."

Checks should not be given to one person to be delivered to another, but should be given only to those to whom they belong, and only when the person presents himself before the timekeeper at the check room.

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* Checkboards with checks should be supplied upon application to the proper officer, stating the number of checks required and the shape of the board that will be the most convenient.

Checks should not be distributed after the time for commencing work, as indicated by the blowing of the whistle or otherwise.

As many check rooms should be prepared as the exigencies of the service require.

When a man goes to work he should pass before the window of the check room, when he will be given the check corresponding to his number. The numbers of the checks not called for will thus represent the men who have not gone to work. A list of these should be made.*

The list should be given to the person whose duty it is to check out the employes, so he may know what men failed to check in and make a record of same on general time book before starting to check out.

The timekeeper should check out the men as near the last hour of the forenoon and afternoon of the working day as the number of the men will permit.

As the timekeeper visits each man he should take up the check given him at the commencement of work and make check mark or other evidence on the general time book that the check has been collected.

Those who have no checks should be allowed only such time as may be certified to the timekeeper for them by the foreman or official in charge.†

Only those who actually deliver checks or slips and who appear in person before the timekeeper, should be allowed time.

In the event an employe should absent himself between the time of commencing work and the time for quitting, the official in charge should notify the timekeeper of the particulars in writing, so the necessary deduction may be made.‡

In the event a check is lost, the person who loses it should be required to pay the cost of replacement.

The foregoing method of taking time is particularly adapted to shops, large stations and other places where a number of men are employed; it should be enforced at all such places.§

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* Form 48, Appendix D.

† Such time should be reported in writing (Form 49, Appendix D).

‡ Form 50, Appendix D.

§ The key to the check system, it is apparent, rests upon the delivery by the employe of the check when checking out. It is only then that record is made on the time book and the employe credited with his time; the possession of the check is evidence that he was present when work commenced. The delivery of the check (and the fact that he is present and at work when checking out) is the evidence upon which the timekeeper bases his record. In the event a check should be secured improperly, it would be of no use, and its value, even if full credit for it were secured, would be infinitesimal only; but as the checks are kept securely locked, and are delivered only to the owners (a record being kept of those not called for), improper possession of them is rendered impossible.

At small shops, stations and other places where only a few men are employed, a simpler plan may be followed for taking time.

But the rules embodied in the foregoing in reference to special reports by foremen, and other matters germane to the keeping of the time of employes correctly, should be carefully observed everywhere.

Instead of using checks and checkboards at places where only a few men are employed, the timekeeper should station himself at a convenient place for the men to pass before him, before commencing work. All employes should so report.

As the men appear in the morning, he should make a check mark under the proper date in the time book on the line opposite their names. This should be repeated again in the afternoon.

The foregoing rules in regard to the timekeeper checking out each employe before the close of work in the morning and afternoon should be observed at the small places the same as where the metal check system is used.

Provision should be made everywhere for keeping accurate account of overtime and of work performed at night, Sundays, holidays and at other times when the timekeeper is absent; the account in such cases should be kept by the foreman or other person designated by the timekeeper and under instructions from him; a report of the time thus kept should be rendered daily. This statement should give the name of the person, the number of hours worked, how engaged and such other particulars as the timekeeper may require.*

For the purpose of verifying the time books, a record of the working hours an employe is absent should be kept. This will be called an "absent time" record. It should be written up daily from the "late slips," "absent sheets" and "quit work" reports. At the end of the month the hours each employe is absent should be footed and deducted from the total number of working hours in the month; to this should be added any overtime the employe has made. The time thus arrived at should agree with the amount allowed the employe. This record book should be kept by some one other than the timekeeper.

So far as possible, the time book returned by station agents should embody the whole force employed at stations in the same department of the service, including agents, clerks, baggagemen, foremen, laborers, yardmen and switchmen; also men engaged in fuel sheds, and at water stations. Time books should, however, be returned for the forces entered on different rolls, respectively. In other words, men who appear on different pay rolls should not be grouped together on the same time book.

* Form 51, Appendix D.

TIMEKEEPING IN CONNECTION WITH CONSTRUCTION WORK.—For use in keeping the time of gangs of men employed on construction work, a set of buttons numbered consecutively should be furnished each month, upon requisition of the timekeeper. These buttons should be worn by employes in such a position that they can easily be seen by the time clerk while making his rounds.

In addition to being numbered, these buttons should also bear a serial letter which will indicate the name or location of the work upon which the men are employed: thus, the series of buttons lettered "A" may be used to indicate work at one point; those lettered "B," work at another point, and so on.

In order to avoid duplications, the name of the manufacturer of the buttons should be printed on the back. The manufacturer should also contract to make no duplicates of any buttons furnished by him.

The color of the buttons should be uniform for each month, but should be changed from month to month so as to avoid danger of crediting time to the wrong employe, since it would be impracticable to assign the same numbers to particular employes each month, owing to the continual changes taking place in gangs of laborers of this class.

A record should be kept of the color of the buttons used each month. When the buttons are received from the men (at the time they are paid), they should be arranged in numerical order, and a record kept of any numbers which may be missing. They should be kept in a secure place, no one being allowed access to them but the timekeeper. After a suitable time has elapsed, they may be used again, care being taken to see that a proper record is made in the time-book of missing numbers. (if any).

Each employe should be given one of these buttons on the first of each month, or when he commences work, and he should retain same until he receives his pay, when it must be surrendered in exchange for his pay-check, time-ticket, or other medium of payment, thus serving in a measure to identify the employe.

Each employe upon being hired and set to work should be given a certificate by the foreman, stating his name, and the date and hour when he commenced work.*

This slip should be handed by the employe to the time-clerk, who should give him in exchange therefor a button, the number of which must be entered opposite the employe's name on the time-book.

On the time-clerk's first check of the employes each month thereafter, new buttons should be given to the old employes, and the proper record thereof made in the time-book. Such employes should be instructed to keep their previous month's buttons until they receive their pay for that month.

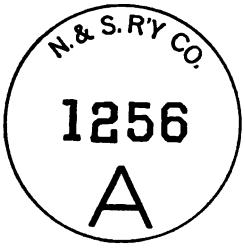
* Form 49, Appendix D.

When the number of employes or extent of the work is sufficient to require more than one clerk in checking the men at work, the territory should be divided into sections. Provision should be made for these different sections to be checked by each time clerk, in rotation.

The time clerks should check the employes at their work four times each day; soon after commencing and just before leaving work, both in the morning and afternoon.

The time clerks should be required to make a report to the time-keeper of all men (by numbers) working at the time of each check, specifying the date, time, location, and nature of the work they are employed upon. This report should be made in duplicate (with carbon), the original being sent to the timekeeper forthwith upon completing each check of the men, the duplicate being retained for a record. Upon receipt of the reports from the time-clerks the timekeeper should post the time in the time-book daily, charging the labor to the proper accounts as shown by the reports. The carbon records of these reports should be compared with the time-books from time to time, by some one other than the timekeeper, to see that no numbers have been added to the lists after they have left the time-clerk's hands. In making out these reports the time-clerks should fill out the spaces provided for the men's numbers in order, and should draw an irregular line through all vacant spaces so as to prevent the addition of any numbers afterwards.

The timekeeper or official in charge should make a personal check of the men at work, at irregular intervals, counting them all. He should compare the number he finds at work with the list as reported by the time-clerks. This system of checking should also be employed by traveling auditors in all cases where gangs of laborers are employed.



The timekeeper should have custody of all the buttons in stock, and should be held responsible therefor. They must be kept in a secure place and their distribution carefully watched.

The same button should never be used for more than one man in one month: i. e., in case an employe leaves the service during the month, his button should not be used again.

Whenever a button is lost, the employe at fault should be required to furnish a statement to that effect, sworn to before a notary public. These affidavits should be filed systematically as a record of buttons lost, and will enable a company to prevent fraudulent practices in case the lost buttons are found and presented by any other than the rightful persons.

METHOD OF COMPUTING WAGES.—The basis for computing wages varies according to the particular arrangements under which the service is performed. Wages are paid by the hour, day, week, or month. In some instances it is based on piece work or specific performance, as in the case of engineers, whose pay is largely based on miles run.

In computing wages, the agreement or understanding under which the labor is performed should be scrupulously observed.

In determining the amount due employes who are paid by the month, for fractional parts of a month, wages should be computed on the basis of the total number of days they are required to work. If an employe works on Sundays or holidays, the amount of his monthly wages should be divided by the total number of days in the month he is required to work, in order to ascertain the rate per day. If he does not work on Sundays or holidays, the amount of wages he receives per month should be divided by the number of days he is actually required to work, in order to ascertain the rate per day.

Fines, if any, for failure to be on hand for work, or for any other reason, should be fixed by the official in charge.

In order to save labor and secure greater accuracy, wages should not be computed from day to day, but in the aggregate, for the whole or part of the month worked. Thus, if paid by the hour, the aggregate number of hours should be ascertained and the gross amount of wages due therefor inserted in the columns provided for such information.

The time books furnish the basis for compiling the pay roll and it is from them the latter is made.

The duty of keeping the time, while entrusted to storekeepers at shops and to persons in charge at other places, does not, as stated elsewhere, preclude the officials immediately in charge from making such frequent examinations as may be necessary to enable them to know, with reasonable certainty, that the names as entered are *bona fide* and that the amounts paid are such as have been agreed upon. In order to make this effective, such officials should be required to have the men in charge of the various gangs carefully scrutinize the pay rolls before certifying to the correctness of the same. An especial and particular value attaches to the certificate of the foreman, for the reason that he knows each man personally, and has knowledge, generally, of the time he has worked. The value of this information cannot be overestimated in auditing accounts, and timekeepers and officials of the company should avail themselves of it to the fullest extent.

There is nothing of a confidential nature about the pay accounts so far as those officers of the company are concerned

who have charge of labor. The officials in charge and foremen should have access to them at all times, and it is their duty to carefully and minutely examine the same.

The work of entering the names in the time book should so far as practicable be performed before the commencement of the month. The names of the officials in charge should be entered first; afterward those of the office force. Following these, the names of the other employes should be entered in alphabetical order.

In writing up the time book and in making the pay roll, the time and rate should be entered in the columns provided, strictly in accordance with the agreement or understanding under which the employe was hired. If he is employed by the month, day or hour, his time should be so entered in the "time" column, and his rate per month, day or hour, should be entered in the "rate" column, thus:—

NAME.	OCCUPATION.	TIME.	RATE.	AMOUNT.
Smith, John	Watchman	1 mo.	$50.00	$50.00
Doe, John	Laborer	28 dys.	1.00	28.00
Roe, Richard	Coal Heaver	260 hrs.	.15	39.00

The time books should be written up in full from day to day. The prompt payment of the forces is dependent upon the prompt rendering of these books.

At stations and elsewhere where no pay roll is made, the time book should be sent forward on the first day of the month, so that those who make the pay roll and the distribution of labor may not be delayed.

The correctness of each time book should be formally certified to by the timekeeper as follows: "I hereby certify that this time book is correct."

This certificate should be signed not only by the person who actually takes the time, but by the official who is immediately in charge; thus, at shops it should be signed by the storekeeper or foreman and by the timekeeper subordinate to them; at stations by the agent and the timekeeper. In fact all who are personally conversant with the particulars of the time book should be required to sign the certificate as to its accuracy.

When, however, the pay roll is made at the place where the time book is kept, only those who are immediately responsible for keeping the time correctly and rendering accurate return thereof need certify to the time book. In such cases the certificate of the foreman and officials will appear on the face of the pay roll.

At the larger shops it may be desirable, for convenience in making the distribution and to expedite work in other directions, to provide a time book for each of the various departments or shops, and for outlying points. These time books should be numbered consecutively and otherwise designate the department or shop they refer to.*

TIME BOOKS.—By reference to the various forms used in keeping time their simplicity will appear; also their cheapness, and the great economy of labor required to keep them, compared with older and more elaborate forms of bookkeeping. It may be said, indeed, without exaggeration, that these time books are as simple as it is possible to make them, and are arranged with all the skill now known to secure results at the least cost, with the least labor, with the least time, and with the greatest certainty.

It is designed to provide special forms of time books whenever necessary, or when greater economy or efficiency can be secured thereby.

A careful study of the time books embodied in the appendix to this volume will illustrate, better than any description, their several purposes. They are intended not only to afford accurate information in reference to the time each man works, but contain a history thereof.

GENERAL TIME BOOK.†—This form is required for general use. In the case of track forces, bridge and building gangs, engineers and firemen, and trainmen, special time books are provided for keeping their time and distributing the same, as described elsewhere herein.

At places where the check system (described elsewhere under the head of "manner of taking time") is not in use, the spaces in this form opposite the name of the employe will be used for noting the presence of employes when checking in.

At the end of the month the total columns should be filled in accordance with the headings.

The occupation of the person should be inserted opposite his name in the column headed "how employed."‡

Under the employe's name should be noted any deductions to be made from his wages; when a time ticket is issued, "time given" should be written in this column; also the number of the time ticket.

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* When more than one time book is thus used, the information they contain should be posted into the distribution book in such a manner that they can be added separately therein, and the totals drawn off for verification; the total of each time book should agree with the footing of that portion of the pay roll covered by it. The total footings of all the time books, as shown by the distribution book, should agree with the total footings of all the pay rolls.

† Form 40, Appendix D.

‡ Thus, "machinist," "carpenter," "blacksmith," "blacksmith helper," etc., designating generally his duties.

If an employe is likely to be engaged upon numerous classes of work during the month, sufficient space should be left below his name to describe the same.*

To secure a correct distribution of the time worked, employes should be required to fill out a "Daily report of distribution of shop labor," at the close of each day's work.† At the end of each working day they should hand these slips to their foreman, or deposit them in such receptacle as may be provided.

The foreman, after collecting them, should examine and sign each slip, and have them ready for the timekeeper at commencement of work on the following day. The timekeeper should then distribute the labor from the slips daily into the general time book, and file them for reference.

On the last day of the month, where a large number of men are employed, labor distribution slips should be filled out early enough in the afternoon to enable timekeepers to distribute the labor and close the time books promptly.

Where men are employed upon "piece" work, a report should be made daily by each employe on the usual distribution slip, showing the number of hours engaged in such work; in addition to the foregoing the foreman in charge should fill out a report showing employe's name, occupation, nature of work, number of pieces, and rate per piece or lot; also the exact time the employe commenced and finished the work reported.‡ A separate report should be made for each employe and all information called for on the report must be furnished. These reports, after being approved by the official in charge, should be sent to the timekeeper for entry in the general time book and filing.

TRACK TIME (AND DISTRIBUTION) BOOK.§—This book is espe-

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* The general time book, it will thus be seen, not only embraces a correct record of the time worked, but contains the details necessary for an accurate classification of the same for entry in the general distribution of labor book. There are two reasons for entering these last named details on this book. In the first place, one line or space on this form is sufficient to keep accurate account for a month of the work performed by an employe on any particular object. Thus, if he is engaged on engine No. 10, the number of the engine is entered in the column headed "How employed"; the hours the employe works on this engine each day are inserted in the column opposite; at the end of the month the total number of hours thus worked is entered; this total is afterward entered in the general distribution of labor book and the amount extended. An important object in specifying the distribution of labor on the time book is that it serves to verify the latter in many ways, and as the pay rolls are written up from this book, the necessity of this verification is apparent.

† Form 52 (Motive Power Department) and Form 53 (Car Department), Appendix D.

‡ Form 54, Appendix D.

§ Form 41, Appendix D.

cially designed to meet the difficulties that attend recording the time and classifying the work of trackmen. It affords an intelligent history of the various kinds of work performed and the extent thereof, such as general repairs of track, laying ties, laying rails, ditching, freshet repairs, ballasting, clearing track, repairing fences, watching track and bridges, repairing bridges, construction, etc.* It is especially designed to relieve the foreman in charge, of clerical work that he has neither the time nor facilities for performing, while affording all the information required to classify the labor accurately and fully.

The number of hours worked each day by each employe should be inserted promptly at the close of the day's work by the foreman in charge; the distribution of this work should also be carried out at the same time in the column or columns in which it properly belongs. At the end of the month all the columns should be footed, and the amounts charged to the various accounts upon which the work was expended should agree with the total wages. This agreement in a measure verifies the accuracy of the whole.

Under the head of "remarks" (miscellaneous) should be entered any deductions on account of board bills, etc., and the name and address of the person or persons to whom such deductions are due. When a time ticket is issued, "time given" should be written in this column. It is also intended to be used to explain the character of any unusual work that may have been done, and any information necessary to a correct distribution of the time.

The book should be signed by the track foreman and forwarded promptly to the roadmaster, superintendent or other official as may be directed, on the morning of the first day of each month.

The pay roll should be made directly from the track time and distribution book by the person designated to perform such duty.

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* An effective system of statistics for track labor and valuable for purposes of comparison, is that which divides a road into sections, according to the supervision of roadmasters, or in smaller units if thought desirable. The exhibit should show the average number of men (full time) per mile of track on the different sub-divisions; also the total cost of repairs of track per mile of road. Following these the gross cost in dollars and cents should be given; then the gross cost for each of the classified accounts that are kept in connection with track labor; viz.: general repairs of roadway and track; laying ties; laying rails; ditching; freshet repairs; track watchmen; ballasting; clearing track of snow and cutting weeds, brush and grass; repairs of fences, road-crossings and signs; flagmen at crossings; bridge and track watchmen; repairing bridges and culverts; repairing cattle-guards; reloading cars; getting cars on the track; station labor; repairing telegraph; unloading coal; watching; piling and hauling wood; construction of sidings, and so on. (See Form 83, Appendix D).

The following instructions should govern section foremen in distributing the time of track men daily to the various accounts on which the work has been performed:

MAINTENANCE OF WAY AND STRUCTURES is chargeable with the cost of all work necessary to keep the property of the company in as good condition as when first built.

If, for instance, a road crossing is worn out, the whole cost of renewing it with one practically the same as the old one was when first built should be charged to Maintenance of Way and Structures; but if in renewing such crossing a larger or better crossing should be put in, then only that part of the expense which would be required to replace the crossing with one like it is chargeable to Maintenance of Way and Structures—the excess or cost of the improvement being chargeable to Construction.

"REPAIRS OF ROADWAY."

Laying Rails.—In this column should be entered time used in taking up and disposing of old rails, and unloading, handling and laying new rails in track, to replace those taken up.

Laying Ties.—In this column should be entered time used in taking up and disposing of old ties, and unloading, handling and laying new ties in track, to replace those taken up.

General Repairs of Track.—In this column should be entered time used in surfacing and aligning track; repairing and renewing frogs, switches, switch stands, rail braces, tie plates, track fastenings, etc.; picking up and loading miscellaneous scrap material from along the roadway, inspecting track, repairing and renewing retaining walls, breakwaters, etc., made to protect track, and taking up old side tracks. The expense of repairing and renewing snow-sheds and snow-fences (when latter are not also right-of-way fences) should be entered in this column.

Ballasting.—In this column should be entered time consumed in preparing, distributing and renewing ballast, in order to put the track in as good order as when originally ballasted.

Filling Bridges, Trestles and Culverts.—In this column should be entered time used in filling bridges, trestles and culverts with earthwork, when the cost of such work is not in excess of the cost of replacing the structure. In all cases the number and location of the structure should be given (in the space provided for "Remarks.")

Cleaning Out Ditches.—In this column should be entered time used in opening, clearing and repairing ditches in order to make them as good as when first made.

Clearing Track of Snow and Cutting Weeds.—In this column

should be entered time used in clearing snow, ice, weeds, brush and grass from the track, and mowing and burning weeds, brush and grass inside of right-of-way fences.

Track Watchmen.—In this column should be entered time of men engaged as track watchmen and flagmen while repairs of track are in progress, rendered necessary by such repairs.

Freshet Repairs.—In this column should be entered time used in repairing damages to roadway and track caused by freshets and washouts.

Note.—Time used in repairing side-tracks should be included under "Repairs of Roadway" under the appropriate headings.

"REPAIRS OF INTERLOCKING PLANTS."

Under this heading should be entered time consumed in repairing interlocking plants, including tower buildings, and switches and signals operated by the plant. In all cases the name and location of the plant should be given in the column headed "Remarks."

"REPAIRS OF BLOCK SIGNALS."

Under this heading should be entered time used in repairing train order, distant and block signals, including tower buildings. The name and location of the structure should be given in the "Remarks" column in each instance.

"REPAIRS AND RENEWALS OF BRIDGES AND CULVERTS."

General Repairs of Bridges and Culverts.—In this column should be entered time used in repairing bridges and culverts; also time of men engaged as watchmen and flagmen while repairs of bridges and culverts are in progress, rendered necessary by such repairs. In all cases the number and location of the structure should be given in the space provided for "Remarks."

Bridge Watchmen.—In this column should be entered time of bridge watchmen who are regularly employed as such, and not required on account of some special repairs being made.

Note.—The cost of repairing the track (rails, ties, guard rails, fastenings, etc.) over the bridges, trestles and culverts, should not be charged to this account, but should be charged to "Repairs of Roadway" under the appropriate headings as given above.

"REPAIRS AND RENEWALS OF FENCES, ROAD CROSSINGS, SIGNS AND CATTLE GUARDS."

Under this heading should be entered time consumed in repairing right-of-way fences, road crossings (including the roadways and streets thereon), track and crossing signs, and cattle guards, or rebuilding them if necessary to do so, in order to render them as good as when first built.

"REPAIRS AND RENEWALS OF TELEGRAPH."

Under this heading should be entered time used in repairing or looking after telegraph and telephone lines, resetting poles, etc.

"LABORERS AT STATIONS."

Under this heading should be entered time assisting station agent in loading or unloading freight, cleaning or caring for stations and station grounds, cleaning stock yards, cleaning snow and ice from station platforms, sidewalks, etc., and caring for switch lamps. In each case the name of the station and nature of the work done should be given.

"FLAGMEN."

Under this heading should be entered time of men while engaged as flagmen at public crossings, except when rendered necessary by repairs to track or similar special work.

"FUEL FOR LOCOMOTIVES."

Under this heading should be entered time consumed in coaling engines, filling coal buckets or chutes when same are used to deliver coal to locomotives.

"CLEARING WRECKS."

Under this heading should be entered time of men employed in clearing up wrecked cars or locomotives, including all time consumed in reloading cars, transferring passengers and baggage or other necessary work resulting from a wreck, such as building temporary tracks around wrecks, etc. The cost of repairing damage to the track caused by a wreck should not be charged to this account, but should be entered under the appropriate headings under "Repairs of Roadway."

LOADING CINDERS AT CINDER PITS.

Under this heading should be entered time used in loading cinders at cinder pits, no matter for what purpose same are to be used.

UNLOADING FUEL INTO STORAGE.

Coal.—In this column should be entered time unloading coal from cars into coal houses, or on the ground, when same is to be stored for future use—no matter for what purpose it is to be used.

Wood.—In this column should be entered time loading or unloading wood from or into cars, when same is to be stored for future use—no matter for what purpose it is to be used.

CONSTRUCTION is chargeable with the expense of building entirely new or additional pieces of work,—such as, for instance, constructing a crossing where there was none before, or building a fence where the right-of-way was not previously

fenced, or laying tiling or making ditches where there were none before.

Construction is also chargeable with the expense of enlarging or improving any existing facilities or structures,—such as, for instance, increasing the length of a crossing six feet, the cost of such extension being chargeable to Construction. Also, if a fence as originally built had four wires, and a fifth wire was added, the cost of such additional work is chargeable to Construction—the idea being to charge Construction (under the proper account) with the added expense which the company may incur in the betterment or improvement of its property.

Any additional expense or outlay which increases the value of the property (excepting that which merely restores it to its original condition when new) is chargeable to Construction.

"TRACKLAYING."

Under this heading should be entered time used in putting in rail braces, tie plates, etc., on main line tracks where there were none before.

"BALLASTING."

Under this heading should be entered time used in ballasting main line tracks which were not previously ballasted; also the increased cost (if any) of labor required in replacing one kind of ballast with a better kind over the cost of the labor required to replace the old ballast with like kind.

"RECTIFYING GRADES."

Under this heading should be entered time used in cutting down grades, changing grade levels, or filling sags, when such work is a change from the grade of the line as originally constructed and not repairing wear and tear due to operation.

"CHANGING AND STRAIGHTENING LINE."

Under this heading should be entered time used in changing and straightening the line of road, eliminating curves, etc.

"WIDENING EMBANKMENTS AND CUTS."

Under this heading should be entered time used in widening embankments and cuts beyond the original width when first constructed.

"FILLING BRIDGES, TRESTLES AND CULVERTS."

Under this heading should be entered time used in filling bridges, trestles and culverts with earthwork when such outlay is in excess of the amount which would be required to replace the structure with another like it. In all cases the number and location of the structure should be given. (The cost of the filling up to the amount required to replace the structure with another like it should be charged

to the proper account under "Maintenance of Way and Structures.")

"DITCHING."

Under this heading should be entered time used in laying additional tiling, making new ditches, and deepening or widening old ditches beyond the depth or width when originally made. (The cost of reopening old ditches or digging out dirt, etc., deposited in such ditches since their construction, should be charged to the proper account under "Maintenance of Way and Structures.")

"FENCES."

Under this heading should be entered time used in building right-of-way and snow fences where there were none before. When a fence is improved by adding more wires or more posts, the time used on account of such work should be charged to this account.

"ROAD CROSSINGS AND SIGNS."

Under this heading should be entered time used in putting in additional road crossings, including roadways and streets thereon, farm gates at new openings, track and crossing signs, and cattle guards; also any labor spent in improving such structures. The location and name or number of each road crossing should be given in the "Remarks" column.

"SIDINGS."

Under this heading should be entered time used in putting in new side-tracks, cross-over tracks, etc., and extending or improving old ones, including grading, ballasting, putting in switches and connections with the main line, and any other expenses connected with the laying of a siding. The time should be entered under the proper headings, "Grading," "Tracklaying," "Ballasting," etc. In the column headed "Remarks" should be given the name and location of each siding, and the authority for doing the work.

"BLOCK AND OTHER SIGNALS."

Under this heading should be entered time used in putting in additional train order, distant and block signals (including tower buildings), or improving old ones. The name and location of each block station, etc., should be given in the "Remarks" column.

"INTERLOCKING SWITCHES."

Under this heading should be entered time used in putting in additional interlocking switches and tower buildings connected therewith; also cost of additions to or improvements of existing plants. In all cases the name and location of each plant must be given in the "Remarks" column.

Blank columns are provided in which should be entered all labor expended which is not properly chargeable under any of the headings preceding. In all cases when time is entered in these columns a full description of the work should be given in the column headed "Remarks."

BRIDGE AND BUILDING TIME (AND DISTRIBUTION) BOOKS.*—This book is especially designed to facilitate the keeping of the time (and distribution thereof) by the foreman in charge of gangs of carpenters and others along the line of the road, engaged in repairs and renewals and in miscellaneous construction work, connected with bridges, buildings, fences, etc. Columns are provided in the blank for the various classes of work upon which the men are likely to be engaged, so that all that is necessary is to enter the number of hours therein. Care must be taken, however, in every case, to locate the work accurately. Much of the information required at headquarters in making up statements of the cost of particular buildings or structures is ascertained from these books; it is therefore of the utmost importance that they should be correctly kept, and that the designation of the structures upon which the expense is incurred should be so clear that it will not be necessary in any case to refer back to the bridge and building department for information. The book is very simple and easily kept, and furnishes the maximum amount of information with the least possible labor to the person who keeps it. Its requirements must, therefore, be carefully complied with.

This book provides for inserting from day to day the number of hours worked by each person; provision is also made for distributing the labor to the account upon which expended. These duties should be performed at the close of each day. The total time worked on the various accounts is noted at the bottom. These added together agree with the gross time worked, and serve in a measure to verify the latter.

Under the head of "remarks" (miscellaneous) should be entered deductions on account of board bills, etc., and the name and address of the person or persons to whom such deductions are due. When a time ticket is issued, "time given" should be written in this column. It is also intended to be used to explain the character of any unusual work that may have been done, and any information necessary to a correct distribution of the time.

This book should be signed by the foreman and forwarded to the shop timekeeper, superintendent of bridges and build-

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* Form 42, Appendix D.

ings, or other person, as may be designated, on the first day of each month.

The pay roll should be made directly from this book by the person designated to perform such duty.

TIME BOOK AND DAILY TRIP REPORT FOR ENGINEERS AND FIREMEN.—At the close of each day's service, engineers should make a detailed report of time worked.* These reports should be handed to the roundhouse foreman, who should examine same and forward them to the timekeeper.

The timekeeper should check these reports with the enginehouse register;† train dispatchers' daily report of train movement,‡ yardmaster's daily report of time worked by switch yard crews,§ or such other data as may be necessary in order to verify their correctness in each particular, as follows: engine number; miles run; hours of service; and class of service rendered. The trip reports, when properly verified, should be entered on the time book.||

In checking the engineers' trip reports and time slips as directed in the preceding rule, the timekeeper should put a proper notation or distinctive check mark on both papers compared in every instance, in order to indicate that same have been compared and checked: this will automatically prevent the passing of duplicate claims.

Whenever changes or corrections are made in trip reports, written notice thereof should be sent to the engineer and fireman at once.

All services claimed as overtime, delayed time, special switching, deadhead time, wrecking and working service, should be submitted to the division superintendent for verification, and no time of this nature should be allowed without his certification.

The superintendent's approval in such cases should be noted in writing on the face of each time slip.

At the end of each month engineers and firemen should furnish timekeepers with a recapitulation of all time worked by them during the month specified.° These statements should be compared by the timekeeper with the entries in the time book, before the pay roll is written, and all discrepancies should be carefully investigated and any errors which may be found should be corrected in accordance with the facts.

On divisions where there are more than one timekeeper,

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* Form 55 (Road service) and Form 56 (Yard switching service), Appendix D.
† Form 57, Appendix D.
‡ Form 58, Appendix D.
§ Form 59, Appendix D.
|| Form 43, Appendix D.
° Form 60, Appendix D.

each one should furnish the other with a list of the men whose time he keeps. Whenever a timekeeper receives reports for men at other shops than his, he should verify them and forward to the official who keeps the time.

When an engineer renders reports for a fireman whose time is kept at another shop than his is kept, he should indicate the shop on the report.

The time book is made up of loose leaves, which are designed to be bound together in book form when the work is completed in the office where the time is kept. Thus the names of the employes are easily kept in alphabetical order (or otherwise, as desired), and new leaves may be inserted wherever needed.

In entering the trip reports in the time book the best plan that suggests itself is to enter both the engineer's and the fireman's time from the trip report, and afterwards check the entries in the engineer's book against those in the fireman's book.

In the column headed "Miscellaneous Time" should be entered all time dispatching, trying engines, acting as witness in law cases, or otherwise that is not actual service as a road or switching crew. In the column headed "Switching Time" should be entered the time in which a crew is engaged in yard switching.

In the column headed "Running Time" should be entered the total number of hours allowed each day for road service. When pay is based on the number of miles run, the total miles divided by 10 will represent the hours. Thus, if 130 miles are run and the engineer is to receive 3.8 cents per mile run, such service should be entered in the book as 13 hours at 38 cents per hours: the term "hour" representing 10 miles. The actual hours for which compensation is to be allowed should be entered in the columns under this heading, according to the class of engine and service.

In the column headed "Engine Number" should be entered the number of the engine as shown on the engineer's trip report. In case an engine crew has more than one engine on a given date, the number of miles run on each engine should be shown. If this cannot be entered in this column, it should be fully explained in the "Remarks" column.

In the columns headed "From" and "To" should be shown the names or numbers of the stations between which the service has been rendered.

In the column headed "Miles Run" should be entered the actual number of miles of each kind of service rendered on each division. All passenger and freight mileage shown should be the actual number of miles between the stations named, as indicated by the time tables.

Gravel service should be computed at 8 miles per hour when compensation is made on the basis of hours worked, and the mileage does not exceed this amount. If the actual miles run exceed 8 miles per hour, they should be shown in this column.

Switching mileage and pusher service should be computed at 6 miles per hour.

The location and kind of service entered in the "Gravel" column should be explained in the "Remarks" column; such explanation is necessary to determine the account to which the expense is chargeable.

In the columns headed "Delayed Time" and "Overtime" should be entered amounts which added to one-tenth of the miles run will equal the number of hours allowed for a run in which delayed time or overtime occurred.

In the column headed "Constructive Mileage" should be entered the excess of the time allowed over the actual time worked, when under the terms of compensation the enginemen are entitled to a full day's pay for less than a full day's work. For example, a freight crew on a certain date makes a trip of 80 miles in less than eight hours, which is all the work they are called upon to do on that day, and which is equivalent to eight hours' work, but as they are entitled to ten hours or a full day's pay, 20 miles is entered in the "Constructive Mileage" column, which added to the 80 miles actually run, equals 100 miles or ten hours' work.

When a time ticket is issued, "time given" should be written immediately following the amount of the wages, so that it may be easily seen when the amounts are transferred to the pay roll.

At the close of the month the books should be footed and proved by comparing the total footings of the hours with those of the mileage. This proof should be shown on each sheet.

In order to prevent the names of employes from appearing on more than one pay roll, the wages of engineers and firemen for shop work should be entered on the engineers' and firemen's pay roll for the amount due them, provided they have made any running time during the month. If they have not, the wages should be entered on the shop pay roll. Contrariwise: the wages of shop men who have running time will be entered on the shop pay roll, provided they have shop time during the month; if they have not, the wages will be entered on the engineers' and firemen's pay roll.

When a man renders both engineer's and fireman's service in the same month, the amounts of the different classes of service should be consolidated before entering it on the pay roll.

The total footings of the hours will be entered on the pay roll, showing the number of hours at each different rate.

TIME BOOK AND DAILY TRIP REPORT FOR TRAINMEN.—At the end of each trip conductors should forward to the superintendents of their respective divisions a report of the mileage made and time worked by their crews.*

This report should be compared by the timekeeper with the train dispatcher's report of train movements, after which it should be entered in the time book.†

In checking the conductors' trip reports as directed in the preceding rule, the timekeeper should put a proper notation or distinctive check mark on both the trip report and the train dispatcher's report of train movements in every instance: this will automatically prevent the passing of duplicate claims.

All trainmen should also be required to furnish a monthly report of time worked which should be checked against the time book by the timekeeper before writing the pay roll.‡ Any differences should be carefully investigated, and errors corrected.

Conductors of construction and working trains should keep a record of the time of their crews on general time book sheets or on a track time book; the general time book sheets should however, be used when not inconvenient, as they furnish greater facilities for keeping accurate account of time worked.

DEDUCTIONS FROM THE PAY OF EMPLOYES—GARNISHMENTS.—It frequently becomes necessary to make deductions from the pay of employes to cover amounts due by them to a company, or which the company may pay on their behalf, such as garnishments, amounts for board, accident insurance premiums, payments on account of watches, uniforms, commutation tickets, fines, deductions, and other things where the interests of the employe are especially benefited by this intervention of a company on his behalf, or the law enforces it, as in the case of garnishments.

When deductions are to be made, especial care should be exercised to prevent omissions, and otherwise secure accuracy.

The amount to be deducted from each employe's pay should be noted in the time book opposite the space provided for entering the total amount of wages due, and in the column headed "Deductions" on the pay roll.

When practicable, entries of this kind on the time book

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* Form 61 (passenger service) and Form 62 (freight service), Appendix D.

† Forms 44 and 45 (passenger service) and Forms 46 and 47 (freight service), Appendix D.

‡ Form 63, Appendix D.

should be made in red ink, so as to make them as conspicuous as possible; in any event the entry should be made promptly, so that it will not be overlooked when making the pay roll or when giving a time ticket or letter of advice.

Amounts which are to be withheld from the pay of employes on account of amounts due from them to the company should be deducted in favor of the paymaster.

Deductions from the pay of employes should be made in the current month, unless special provision is made to the contrary.

No one should be allowed to bind a company by guaranteeing that it will pay sums due or to become due by employes; the most that it should undertake in such cases is to collect such amounts as it may think proper, and in the event of error or neglect upon its part it will not be responsible for any losses that occur in consequence.

In the event of loss through omission to note on a pay roll or time ticket that a deduction should be made, or in the event of failure to deduct the same from the wages of the payee afterwards, the person through whom the neglect arises should be held personally responsible to the company for any loss it suffers in consequence.

A company should not undertake to collect from its employes any board bills, etc., unless the employe authorizes the company in writing to withhold such amounts.

No one should be authorized to make deductions from the pay of employes on account of sums due by them, even when requested to do so by the employe (except in the case of amounts due the company or for garnishments), unless instructed to that effect by the proper officer, as it is not desired that the company shall intervene in such matters except in cases of particular emergency where the convenience of the employe and the interests of the company are alike advanced thereby.

In every case where the company undertakes to make collections, an immediate record thereof should be made in the office where the time of the employe is kept, also where the pay roll is made.

When a great many deductions are to be made, a blotter should be kept on which the particulars should be entered as they occur. Afterward an alphabetical list of the same should be compiled for use and reference in making the pay roll. The aggregate amount of this list should agree with the total footings of the blotter.

In reference to garnishments against the pay of employes, immediate notice should be sent those whose duty it is to issue time tickets, of all suits of this nature; notice thereof

should also be sent the paymaster and general accounting officer. In such cases immediate return should be made to the official sending the notice of the amount due the employe, and whether such employe is married or single.

No time ticket or voucher should be made in favor of a person who is garnisheed; or, if made, it should be canceled by writing "Garnisheed" across its face.

When the pay of an employe is garnisheed, the total amount of wages unpaid on the roll at the time should be withheld until the settlement of the suit. In the event the payee has given orders against his pay, or a portion of it is set aside for any other purpose, such claims should not be paid until formal notice of the withdrawal of the suit or its settlement has been given by the proper official.

Prompt notice should be given those issuing pay rolls and time tickets, of the release of garnishments.

At the end of each month the paymaster should render the general accounting officer a list of all persons whose pay has been garnisheed, giving the name of the person, his occupation, place of residence, and the amount of wages due him. The amount of wages due those garnisheed he should turn over with the list. The general accounting officer should attend thereafter to the settlement of the accounts thus rendered.

No time ticket should be issued without careful search to see whether any notice of garnishment has been received, nor should any person be paid by the paymaster or general accounting officer without a similar search being made, as it may sometimes occur that tickets will be issued in advance of the receipt of the notice of garnishment.

PAY ROLLS.*—The pay roll is the most important voucher that a company has. It is made up of innumerable petty items and embraces the result of a vast network of accounting and preliminary clerical work. The utmost care is required to be exercised in its compilation, first in keeping the time of employes, afterward in determining the wages due them, and finally in making the roll. The officials who are required to make the pay roll will be especially designated in each case.

The pay roll is intended to show in detail each man's service, his name, where the check for his wages is to be sent, what he does, where employed, the time he has worked, the rate he receives, the gross amount of wages he has earned, the amount (if any) to be deducted from his wages, to whom

* Forms 66 and 67, Appendix D.

the deduction is payable, the balance due the employe, and finally the receipt or evidence of payment by the company.*

Amounts due contractors for services in handling coal, rails, lumber, scrap or other material, should not be entered on the pay roll, but should be paid by separate voucher.

Wages should be entered on the pay roll for the month in which the service is rendered.

Before writing the pay roll, the footings and extensions of the time books from which it is made should be checked by some person other than the one footing and extending them in the first instance.

The amount of each roll should agree with the footings of the time books from which it is copied, and these in their turn should agree with the distribution of labor sheet or book. Each serves as a check upon the other, and in a measure proves the accuracy of the whole.

The natural divisions of the service should be observed in making the pay rolls. Only such employes should be grouped together on a roll as the local officials who are required to certify to the correctness of the same are personally able to vouch for. This will necessitate a separate roll for each division for roadway and track; for engineers and firemen, for each shop; for bridge and building gangs; for the station force; for trainmen; for extra or special gangs of men; also for the general office and for employes of particular departments stationed off the line.

The rolls for small shops on a division may be bound together in one book to lessen clerical work. In such cases, provision should be made for inserting the approval of the general officers on the last sheet in such book instead of upon each roll.

When the pay rolls of several shops are bulked together in the above manner, a recapitulation should be made showing the amount of each pay roll and the amount of the whole.

When the accounts of a small shop or round house are kept under the supervision of some central shop on a division and there are only a few names to be entered on the roll, such names may be incorporated on the pay roll of the central shop.

Pay rolls should be made on or before the fifth of the succeeding month. They should not be delayed in any office through which they pass. If the official in charge is unable

* Many companies divide their pay rolls into two classes, namely, those who work and those who do not—"active" and "disabled." The disabled embraces those that are pensioned (if any), those who have been injured in the service, are sick, or are carried on the pay roll for any other special reason. The plan is an excellent one. It shows at a glance the extent of its expenditures in this direction; the division, moreover, facilitates accounting.

to certify to them immediately, owing to absence or other cause, his assistant or clerk should act for him without delay. The date upon which each certificate is attached should be entered opposite the signature of the person certifying. Rolls should not be detained in any office to exceed six hours. Any dilatoriness in completing or forwarding the rolls retards the work of others, and may result in a serious injury to the service. Promptness should, therefore, be the rule in all cases.

In order to anticipate so far as possible, the labor of making the pay roll, it may be commenced before the close of the month at shops and other points where a large number of men are employed. But only the names and the rates paid may be entered in advance. This will serve to divide the work and lessen the amount at that particular period of the month when the rush is greatest.*

The name of each and every employe should appear upon the pay roll, and no employe's name should appear upon more than one roll (except in case of transfer of employment to another department of labor, or from one division to another, during the month), or in more than one place upon any roll.

In those cases where horses not owned by a company are employed by it, and pay therefor is to be entered on the pay roll, the name of the person from whom they are hired should appear on the roll opposite the amount. The pay roll should state whether the pay is for services performed by horses alone, or teamsters and horses.

When men are granted a furlough or are absent from duty for any reason, and they employ some one to take their place during their absence, the name of the person thus employed should be entered on the pay roll of the company and the amount of wages he is entitled to inserted therein, the time and wages of the person whose place he takes being omitted for the period mentioned.

When an employe is transferred from one department to another, his name should appear on the pay roll for each department for the amount due him.

When employes run in common over two or more divisions, their whole pay should be returned on the roll of one of the divisions, the portion belonging to the other divisions being charged in the distribution of labor book under the proper operating or construction account to such divisions. This rule embraces employes at the junction of two or more divi-

* In the event the roll is made at some central shop, a memorandum of the names and rates paid may be sent by subsidiary shops the latter part of the month to the person who makes the pay roll, so as to anticipate the labor as much as possible. This rule is especially to be observed in regard to the time of shopmen, track and station employes, etc., where the pay roll of such forces is made at some central point.

sions, employes running over two or more divisions, and others similarly engaged. A statement of the amounts thus charged should be rendered monthly to the debtor division by the official making the charge.

When an employe works in common for two or more departments on a division the whole amount of his pay should be entered on the roll of one of the departments interested. The department thus returning the time should ascertain the distribution of the time worked for the other department, and should include it in his distribution of labor book.

The following rule should govern in reference to transfers within the same department of service on a division: When the place of employment is changed during the month, say from one station to another, or from one track section to another, the name of the person thus transferred should be entered on the roll at each place or under each head where engaged. But the amount due for services should only be extended opposite the last place where employed; at this place a recapitulation should be made on the roll, giving his name, the various places where he worked, separately, occupation, time, rate and wages; following and opposite this recapitulation the total sum due him should be carried into the "amount" column. At each of the places (under each of the heads) where engaged during the month the name should be given, also occupation, time and rate; opposite this should be noted "transferred to page number —" giving page and amount of wages transferred. The observance of this rule will keep the record of service intact and at the same time prevent a name appearing on a roll more than once for payment. The rule applies only to transfers in the department of labor covered by a particular pay roll. If an employe in the train service of a division should be transferred to its station service, the name and wages due for the respective kinds of work would appear on the roll for each, and so on. (An exception to this rule is made in the case of engineers and firemen having shop time, or vice versa, as provided herein.) In making the engineer's and firemen's pay roll a memorandum should be made opposite each name of shop time worked.

Amounts deducted from the pay of employes should be entered on the pay roll opposite their names, in the column headed "Deductions," giving the name of the payee in each case.

On the first page of the pay roll should be shown the aggregate amount due each payee for deductions made from wages due employes. This statement should be headed "deductions from the pay of employes." It should be footed and the total should agree with the gross amount of the column in which deductions from the pay of employes are inserted. The

receipt of the payee should be taken in every case by the paymaster at the time of payment.

In the event a time ticket has been issued, the words "time given" should be noted in the column headed "by time ticket" opposite the name of the employe; "ditto" marks should not be used, but the words "time given" written in full in each case. The person who makes the roll is responsible for the insertion of notations of this nature on the roll.

After the pay roll is written, it should be compared with the record of time tickets issued during the month, in order to see that all such entries are properly marked "time given," and to verify the amount of wages allowed.

In the event the pay of an employe is garnisheed, the fact should be noted in the same way opposite the name of the employe on the pay roll by the official to whom the notice is sent. When the garnishment is released or the suit settled, the date and particulars thereof must also be noted on the pay roll.

In the event of the decease of an employe to whom wages are due, the pay roll should be marked "Deceased" in the column headed "By time ticket," opposite the name of the employe.

The sheets of each pay roll should be numbered consecutively in the upper right hand corner, commencing with number one.

In making the pay roll, the name of the official or officials in charge should be given first, then the clerical force, if any; afterwards the names of the employes should be arranged in alphabetical order, and following the name of the foreman of each gang.

In entering the names on the pay roll, the surname should be given first; afterward the Christian name in full; the initials also, if any; thus: "Howard, Peter C." This rule should be carefully observed, as in the multiplicity of names that appear it is unavoidable that the same name and initial will frequently occur, the only manner in which they can be distinguished being the Christian name. In some cases this is also the same; when this is so, a distinct number should be inserted opposite each, so as to distinguish between them.

In order to facilitate payment and for other reasons, the employes on each pay roll should be numbered; the number may be entered at the left of the name.

As soon as a roll has been completed, the official whose duty it is to render the distribution of labor book therefor should send a comparative statement of the roll to the division superintendent interested, so that the latter may have early advice of the extent of the expenditure incurred.

Each pay roll should be bound with a good substantial

paper cover, in the office where it is made, the name, number and amount of the roll being legibly written thereon. Covers for pay rolls should be kept in stock by the stationer so that they may be uniform and suitable.

Pay rolls should not be folded, but should be sent forward under covers provided by the stationer.

In making the pay roll and in certifying thereto no intermediate or blank lines should be left.

The certificates of the correctness and authenticity of the pay roll should be made on the last sheet, and should be signed by all those who are conversant with the facts or in any way responsible for the labor.

At shops the roll should be certified as follows:

First, by the foreman. If there are two or more foremen, each should certify immediately after the names of the gang under him.

Second, by the clerk or clerks who take the time. In the event there are more than one, their certifications must follow immediately after the last of the names of the employes of whom they keep the time, respectively.

Third, by the storekeeper, or head timekeeper, who is responsible for the general correctness of the account.

Fourth, by the official in charge of the shop or shops. In the event, there are two or more officials, their certifications should follow immediately after the last name of their respective forces.

Fifth, by the master mechanic or superior official immediately responsible for the labor as a whole.

Sixth, by the division superintendent, general superintendent, general manager, and finally by the officer who approves for payment.

When a pay roll reaches the paymaster he should at once cause the extensions and footings to be carefully re-examined, and when he has made such examination and corrected all errors, he should append his certificate to that effect.

In cases where employes located at different points are grouped in one pay roll made at some central point say for station, train, track, yard, and other scattered forces of a division, the rules and regulations that require the local officials in charge to certify to the correctness of the pay roll, may be dispensed with, as such certification would require that the roll should be sent to them. This would occasion both delay and inconvenience, possibly loss. The certification of these officials should, however, be attached to the time books or sheets from which the roll is made.

The general form of certification to be attached to each pay roll is as follows:

"I certify that the foregoing men were employed as stated."
.....Foreman.

"I hereby certify that this pay roll is correct."

.....Time Clerk .....19....
.....Storekeeper .....19....
.....General Foreman .....19....
.....Master Mechanic .....19....
.....Supt. M. P. & M.....19....
.....Division Superintendent....19....
.....General Superintendent....19....
Approved.....General Manager .....19....
Approved for payment.....Auditor of Expenditures...19....
Extensions and footings examined and all errors corrected,
.....Paymaster .....19....

Separate rolls should be made for the locomotive and car department employes. When an employe works for both departments the heads of these departments should specify on which roll his name should appear, and the name of such employe should appear on such roll exclusively. Unless instructed to the contrary, however, these rolls should be bound together under one cover and recapitulated on the last page. On these rolls the certification of both the superintendent of motive power and machinery and the superintendent of the car department should be provided as follows, viz.:

I hereby certify that the foregoing locomotive department roll is correct.

.....Supt. M. P. & M.....19..

I hereby certify that the foregoing car department roll is correct.

.....Supt. Car Dept.....19..

The duty of certifying to the pay roll, it should be remembered, is not a mechanical one, but one of vital consequence to the company. It should be done intelligently and with a due understanding of the responsibilities that attach to such certification.

Each one who certifies to a roll is responsible to the extent of his knowledge and discretion. This is especially true in regard to the local officials who make the pay roll or who have personal knowledge of the facts it contains. Thus, the foreman should never in any case certify to the correctness of a roll until he has carefully examined the list of names, also the rates paid and the time each man has worked. The certification of the foreman, it may be said, should have the effect to prevent material inaccuracies, as he knows personally the name of every employe; his certification affords the best evidence possible that the figures of the timekeeper are substantially correct.

Amounts due to parties for deductions from pay of employes should, in the absence of instructions to the contrary, be paid only by the paymaster.

The appliances of the paymaster for paying the rolls are especially designed to meet the convenience of employes and the needs of the company, and he is expected and required to pay each and every employe, except when payment is made by time ticket to those who leave the service of the company, or are transferred from one division or department to another.

A particular time should be, so far as possible, designated for paying the force, according to the labor required in examining the accounts, completing the pay rolls and making other and necessary preparations. It will vary according to the exigencies of the service. Employes are expected, however, to wait for their wages until the paymaster is ready to pay them. But when a person leaves the service of the company and cannot await the usual course of payment without inconvenience or hardship, or is disinclined to do so and there is no reason for withholding his pay, the officer who makes the roll should make time ticket or in case the pay roll has been made, communicate with the paymaster in reference to the matter so that he may send check for the amount or make payment in person.

Whenever a gang of men is to be discharged, the paymaster should be notified in advance so that he can arrange for its payment. It is desirable to avoid the issuing of letters of identification or time tickets under such circumstances, if possible. Risk may be avoided and the men accommodated by the paymaster giving the matter attention.

No one in the service of a company should be allowed to traffic in the wages of the employes or to discount their pay. A company should meet every reasonable and proper requirement in this direction without the intervention of others.

TIME TICKETS*—ISSUING SAME.—A time ticket is a certificate of wages due the person in whose favor it is made.

The utmost circumspection should be exercised by those who are in any way concerned in issuing these important documents, the same care, in fact, that would be exercised in issuing a check on a bank, or making payment in any other manner.

Blank drafts, time tickets, letters of advice, orders on paymaster and similar documents should be kept locked in a safe or other secure place where they will be accessible only to those authorized to use them.

In no case should a time ticket be signed or countersigned until the persons who perform such duty have assured themselves that the ticket is correct in every particular and in

* Form 68, Appendix D.

accordance with the facts, and that the service has been performed as stated.

For the better protection of the company and the employe and to obviate any doubt as to the terms and conditions upon which every time ticket is issued, the following form of agreement is printed on the back of the ticket; this agreement the payee is required to sign at the time the ticket is delivered to him:—

AGREEMENT UPON THE PART OF PAYEE.

"This Time Ticket, upon which payment for wages is made, is accepted by me in full payment for services of every name and nature "for the ..... Railway Company, or companies owned or "controlled by it, up to and including the time specified herein.

"It is accepted by me subject to the rules and regulations of the "company on whose account it is issued. I agree not to negotiate it "or attempt to collect it through any bank or collection agency, but to "present it in person to the paymaster of the company, or such agent "as may be authorized to pay it.

"It is also understood and agreed to by me, as witnessed by my signature hereto, that in the event I should lose this ticket, or it should "otherwise pass out of my hands, and in consequence the amount called "for should be paid to a wrong person, I will not hold the company responsible for the amount."

....

Signature of Payee, i. e., person to whom this ticket is issued.

Witness.....

Title.....

Another and an important purpose that will be served by the foregoing agreement which the payee signs, is that it will enable him to secure the sum due him with the minimum amount of trouble. It will facilitate his identification in presenting the ticket for payment. It renders it unnecessary for him to hunt up witnesses. The payee must personally sign his name to the agreement. If he cannot write, he must make his mark. This must be done at the time the ticket is delivered to him and in the presence of the person issuing it, who must sign as a witness. In those cases where the person issuing the ticket does not personally deliver it to the payee, the agreement must be signed in the presence of, and must be witnessed by, the official who does deliver it. The signatures of those who act as witnesses must be known to the paymaster and agents of the company who may be called upon to pay time tickets.

When it is impossible for the person issuing the time ticket to deliver the same to the payee personally, he will forward the ticket as directed and send with same an Identification Blank, properly filled up, to insure the ticket being delivered to the proper person.*

Before delivering the time ticket to the payee, the maker should call the payee's attention to the nature of the agree-

* Form 71, Appendix D.

ment printed on the back of the ticket, and when the payee cannot read, the agreement should be read to him by the maker, so that in signing same he will do so understandingly. In all cases where the payee cannot write (and is unknown to the payor) he must be given an Identification Blank, properly filled up, so as to insure the amount being paid to the proper person.

It should be the duty of the stationery storekeeper, under the advice of the proper officials, to furnish blank time tickets to such agents and others as have occasion to use them. They should not be furnished promiscuously, but only to those who have employes under them, who are coming and going and require to be paid when they leave the service; at other places a blank time ticket may be furnished when occasion to use it arises.

Requisitions on the stationery storekeeper for blank time tickets should be approved by a responsible officer before being honored.

A careful record should be kept by the stationery storekeeper of the persons to whom blank time tickets are issued.

Time tickets should be numbered consecutively by the printer, and no two tickets should bear the same number.

In order to minimize the risk, no time ticket should be issued for a sum exceeding $150.00.

A time ticket should show the name of the employe, the time worked, rate, occupation, place and amount.

The reason for issuing a time ticket should in every case be stated on the face thereof. Thus, if the payee is no longer in the employ of the company, it should be marked "left the service;" if he has been detailed to another division, it should be marked "transferred to blank division," and so on.

In order to enforce responsibility and insure the preservation of the record of each ticket issued and the proper notation thereof on the pay roll opposite the employe's name, it is required that each ticket should be signed by the responsible officer in whose department the employe works.

It should be countersigned in every case by the timekeeper or timekeepers.

Tickets issued at shops should be signed by the storekeeper and countersigned by the master mechanic.

Tickets issued to employes at stations, upon trains and in connection with the track and bridge and building service, should be signed by the official who makes the pay roll for such forces, and countersigned by the person or persons who keep account of the time and make return thereof.

It is the duty of the person who makes the pay roll to see that it is marked "time given" opposite the name of every employe to whom a ticket has been issued. Neglect to do this

should entail personal responsibility for any loss the company may suffer in consequence thereof.

A time ticket should not be delivered to the payee until it is both signed and countersigned. When this precaution is disregarded the payee neglects in many instances to have the ticket perfected and is put to much delay and inconvenience in consequence, as no ticket can be paid where these formalities are not observed. If an emergency should arise rendering it necessary to disregard the rule in respect to signatures, the ticket should be enclosed in an envelope sealed and addressed to the person who is required to sign it, and the payee specifically directed to go to such person and obtain his signature, otherwise payment will be refused. Such an emergency will sometimes arise, it is proper to say, when the persons who sign are located at different points and the necessary signatures cannot otherwise be procured without greatly inconveniencing the payee. In all ordinary cases, and where the parties are located near each other, all the signatures should be attached to the ticket before it is delivered.

In filling up a time ticket ink should be used or other material impossible to be changed or canceled without detection.

The time ticket should be filled up in exact accordance with the requirements of the blank.

The name and amount written in the body of the time ticket should commence close to the left in the spaces provided; the unoccupied space should be filled in with an irregular line. When the amount of the time ticket does not include the fraction of a dollar, the character shown below should follow immediately after the written amount, and an irregular line should be drawn through the unused portion of the space provided, terminating with a similar character, thus:

Forty-five ℔ ~~~~~~~~~~~~~~~~~~ ℔ Dollars, $45 ℔ ~~~~~~~~~~~~~~~~~~

This character should not be employed when the amount includes the fraction of a dollar, the proper way being to write the fraction closely following the written amount in dollars, drawing an irregular line through the unused space, for example:

Forty-five ℔ ~~~~~~~~~~~~~~~~~~ Dollars, $45 ℔ ~~~~~~~~~~~~~~~~~~

Neither the word "and" nor the character "&" must be used between the amount in dollars and the fraction, nor between the different words making the written amounts. Whenever the amount of a time ticket is for a fraction of a dollar it should be written as follows:

Cents only ℔ ~~~~~~~~~~~~~~~~~~ Dollars, $ ℔ ~~~~~~~~~~~~~~~~~~

Alterations or erasures should not be made on the face of a time ticket. When an error or inaccuracy occurs which necessitates an alteration or erasure, the ticket should be canceled

by being punched and the signatures destroyed. The ticket thus destroyed should be left in the time ticket book in its proper place.

A time ticket should never contain the name of more than one person, i. e., a time ticket should be made for each person except as provided for below.

When a large number of men leave the service in a body involving the labor of making a considerable number of tickets, a time ticket pay-sheet blank may be substituted.* This blank provides for making the time ticket pay-sheet and a record at one writing by means of carbon sheets, and the record should be filled out and retained in every case. This form permits the insertion of a large number of names on one sheet. It is a time ticket to all intents and purposes and should be governed by the same conditions. The names and other particulars should be entered in appropriate places, and the receipt of the payee taken in each instance in the column provided opposite the name. Time ticket pay-sheets thus paid should be stamped by the agent or person paying them on the date they are paid. When men are paid in this manner on time ticket pay-sheets, the amount entered in the column "paid on account," it will be understood, should be withheld from the total wages of the payee by the person paying same.

The time ticket should be given directly to the payee for presentation by him for payment.

In the event of the death of an employe, a time ticket should be issued for the amount due, stating on its face that the employe is dead; this should be forwarded to the general accounting officer. At the same time the general claim agent should be notified of the issuance and disposition of the ticket by the person making it, so that he may take measures to see that it is paid to the right parties.

When an employe leaves the service before the pay roll has been sent forward to headquarters, a time ticket may be given him (under the rules) for the amount payable to him at that time.

Time tickets should not be given after the pay roll has been sent forward without first advising the general accounting officer or paymaster, and receiving a written reply, that the roll has been marked opposite the person's name, "time given." After such reply, and not before, a ticket may be given.

All notices to mark pay rolls "time given" should give the name and number of the employe; also the name of roll and amount due.

Time tickets should not be given to persons whose pay has

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* Form 69, Appendix D.

been garnisheed or for any reason withheld, except by permission of the proper officer.

Before issuing a time ticket, care should be taken to see that the amount of any order which may have been given on account of the company, or in which it is interested, or for which it is responsible, or for which the payee is properly responsible, is first deducted. In such cases, the amount of the deduction should be noted on the time ticket, also on the pay roll.

Every precaution should be adopted to prevent over-payment.

Whenever any one who handles the funds, stores or other property of the company, leaves its service, such portion of his pay should be retained until his accounts can be audited, as may be necessary to protect the company against loss.

When the accounts of such persons have been audited, it is the duty of the proper officials to see that any balance of pay to their credit is remitted to them as soon thereafter as possible, unless there should be some reason for withholding the amount still further. In the majority of cases the withholding of any portion of the wages of an employe causes him inconvenience, and is sometimes a severe hardship; no unnecessary delay should, therefore, under any circumstances, attend payment.

When an agent leaves the service, or is transferred to another division, a time ticket should be sent to the traveling auditor making the transfer, for all wages due the retiring agent, except twenty-five dollars, which latter amount should be withheld, awaiting the final auditing of his accounts. If the traveling auditor finds the affairs of the agent to be satisfactory, he should deliver the time ticket to him; otherwise he should note across its face, "to be credited in account," and remit it to the general accounting officer to be credited to the agent pending the settlement of his accounts.

The whole, or a portion of the pay of a conductor who leaves the service should be withheld until his accounts are examined and balanced, and the property in his possession turned over to the company. No conductor should be paid by time ticket or otherwise (or at most only for a part) until advice has been received from the ticket auditor that the property in his possession has been accounted for, and his accounts balanced. As soon as the ticket auditor has completed his investigations, he should forthwith send notice of the disposition to be made of the wages of the conductor.

When a time ticket is issued for a part of the pay of an agent or conductor, as indicated above, the roll should be marked "time ticket issued for——," noting the sum. In ref-

erence to the balance of pay due, the roll should be marked: "hold balance subject to settlement of account."

In order further to prevent misunderstanding or loss to the company, everyone who handles its funds or securities should be required to sign an agreement permitting the company to withhold his pay, or any portion thereof, upon his leaving its service, until his accounts can be audited and his indebtedness accurately determined. The form of agreement should be as follows, viz.:—"It is hereby agreed that in case the employe whose name is attached hereto shall quit the service of the blank company, or be discharged therefrom, the said company shall have the right to withhold any sum which may be due him, until after his accounts have been examined and audited, and in all cases until the regular pay day of the company."

NOTE.—Superintendents of divisions, civil engineers and others responsible for labor, who sign time tickets for employes scattered along the line, may furnish blank time tickets for the use of their subordinates, as required. But in every case they should keep a record of each blank issued, to prevent improper use and to prevent a ticket being paid without a record being made on the pay roll of its issuance.

REQUEST FOR A TIME TICKET.*—At shops and other places where a large number of men are employed, a written request should be given by the foreman to the person to whom it is desired to issue a time ticket. This request should be presented by the payee to the person whose duty it is to make the ticket. After the request has been filled it should be canceled and the date of the issue of the time ticket noted in ink across its face. It should then be filed away for convenient use and reference.

Whenever the person to whom a "request for time ticket" is given is not known to the person whose duty it is to give him the time ticket, he should be identified to the latter by means of an identification blank properly filled up.†

The form of request is also designed for use in those cases where the officials who sign and countersign the time ticket are located at a distance. It is intended for agents, trackmen, conductors, and similar employes who are required to make requisition on a division superintendent or other officer for a time ticket.

It is desired, however, that the time ticket itself should, whenever practicable, be used in such cases instead of a "request." When the time ticket is used in such cases it should be filled up in due form and countersigned by the timekeeper and agent, conductor, roadmaster, or other per-

* Form 70, Appendix D.
† Form 71, Appendix D.

son or persons who keep the time or are immediately responsible therefor. The ticket thus made and countersigned should be forwarded by express or other secure means to the official who is to sign it; when signed by him and the necessary record of its issuance made for entry on the pay roll, it should be returned to the person issuing, by express or other secure means.

It is the duty of the person who honors a request for a time ticket or who signs a time ticket, to assure himself that the service has been performed as stated.

PAYMENT OF TIME TICKETS.—Time tickets issued in accordance with the regulations of a company governing such matters should be payable by agents and other authorized officials after being properly endorsed.

Agents should only pay time tickets issued by authorized officials having jurisdiction over the division upon which their station is located, unless special requisition is made upon them to do so by a responsible official of the company.

The same care should be exercised, so far as possible, in the payment of time tickets that is enforced by banks and other institutions in the payment of checks, drafts, and similar evidences of debt.

The person who pays the ticket should be assured in every instance that it has been issued by authorized officials, and that it conforms in all respects to the requirements of the company.

Paymasters and agents should not be authorized to pay time tickets unless they know the person presenting the same to be the one named in the document, and in the event they do not know him, they should cause him to be identified by a responsible party precisely as banks would under similar circumstances, or, if this is not practicable, by means of the identification blank provided for such purpose.* This fact, being known in advance, by those who issue tickets, they should, to save the payee inconvenience, take measures to have him identified in the event he is not known by the person whose duty it is to pay him.

In no case should a time ticket be honored unless presented by the person in whose favor it is made.

As the rules and regulations under which time tickets are made by the company cannot be known except to its authorized officials, it is impossible that they should be purchased or negotiated by others (or issued under such conditions) without undue risk. For these and other reasons, they should, therefore, not be paid except to the person in whose favor they are drawn. This fact is plainly printed on the face of each ticket. They are, therefore, not valid except in the hands of the employe to whom issued.

* Form 71, Appendix D.

When a time ticket is presented for payment, the person paying the same should require it to be endorsed by the person presenting it. If the endorsement conforms to the signature of the payee written at the time the ticket was delivered to him, it will afford corroborative evidence that the ticket is presented by the proper person. If the payee cannot write, he should be required to make his mark, which mark should be witnessed by some disinterested and responsible person before the ticket is paid.*

The discounting of the pay of employes is contrary to the wishes and intention of a company and the interests of the employe. It is the design of a company to pay all wages promptly and without rebate, when due. This it should do. There can, consequently, be no necessity for anyone who has wages due him negotiating his pay. No one in the service of a company should be permitted to buy or discount the pay of an employe.

When a time ticket is presented to an agent who cannot pay same, the person holding the ticket should be referred to some agent who can pay it, or the matter should be referred to the general accounting officer or paymaster.

Whenever the receipts of a station are not likely to be sufficient to pay the wages of men leaving the service of a company, payable at such station, the general accounting officer or paymaster should be notified in advance, so that the necessary funds may be provided to meet the emergency.

When a large number of men leave the service daily, at a particular point, as sometimes happens on construction work, and the agent's collections are not sufficient to pay the time tickets, arrangements should be made (through the general accounting officer) with a local bank to pay them, and at the close of each day the agent should give the bank a draft on the general accounting officer in exchange for the time tickets paid during the day. The time tickets should be stamped by the agent with the station stamp and remitted direct to the general accounting officer as a special remittance, to the agent's credit, to offset the draft he has drawn. In the event it is impracticable to make such arrangements, a working fund, sufficient to meet the demands, should be arranged for through the general accounting officer.

The prompt payment of time tickets is especially desired by a company, and all who hold them should be requested to present them without delay for payment, and every reason-

* The witnessing of the cross, as provided for above, is not designed to be so much an identification of the payee as it is of the fact that the amount has been paid by the paymaster, or other agent of the company, in good faith.

able and proper facility should be extended to those who hold them to get their pay.

It is desirable that men who leave the service of the company (on whose account time tickets are issued) should be paid without delay on the division where they worked.

Time tickets issued in the vicinity of the office of the paymaster (and in other cases when practicable and convenient) should be presented for payment directly at such office, by the person in whose name they are drawn.

Whenever discharged men are sent to headquarters or elsewhere for their pay, they should be furnished with specific instructions as to where they are to get their pay, of whom, amount, etc.

The person who pays a time ticket cannot act as a witness to the endorsement thereon.

When there is a deduction for any reason from the amount due the payee, only the net amount should be paid by the agent. Any amount that may be due by payee for board, or for any other purpose (as per deduction upon the time ticket) should, in the absence of instructions to the contrary, be settled directly by the paymaster or general accounting officer.

After a time ticket has been paid by an agent it should be stamped with the station stamp on its face, also on its back, underneath the endorsement of the payee. It should then forthwith be sent to the paymaster.

In order to avoid loss, agents and others who pay time tickets should keep themselves advised in regard to those who are authorized to issue the same, the names that should be attached and such other particulars as may be necessary.

In order to further this purpose, division superintendents should notify agents in writing of the names of persons who are authorized to sign time tickets for their respective divisions.

In the event an employe whose pay is garnisheed should be given a time ticket through mistake, such time ticket should not be paid; but the person to whom it is presented for payment should write the word "garnisheed" across the face of such ticket, and should then take the same up and return it to the official who signed it.

Time tickets should be made invalid if not presented for payment within thirty days from their date. This fact should be printed on the face of each blank. This provision should be rigidly enforced, as it is designed that tickets should be presented for payment without delay by those who hold them, and especial provision is made to accomplish such result without inconvenience or expense to the holder.

In the event a time ticket is presented that has expired by

limitation, as provided in the preceding paragraph, notice of the fact should forthwith be sent to the paymaster, giving him the name of the payee, his present address, the kind of service performed for which the ticket was issued, amount due the payee and the names of the persons issuing and countersigning the ticket and the date of issuance thereof. But the ticket should not be paid without a special order to that effect from the paymaster. Such tickets may, however, be paid at the discretion of the paymaster or general accounting officer if *bona fide* in their nature.

But in no case should wages be paid on the roll in a case where a time ticket has been given, without the presentation of such ticket, or unless it has been duly and properly canceled. Except that in the event of the loss of a time ticket the payee may be paid, as provided for below.

In the event a time ticket is lost, notice should be issued forthwith (by the official who signed it) to all agents and officials authorized to pay the same, directing payment to be stopped. As it is extremely difficult and inconvenient to keep a record of documents of this kind, and as the danger is always great that they may be paid inadvertently, the utmost care should be taken to prevent loss. In furtherance of this they should, in every case, be forwarded by express, or in some other way equally secure, when being sent back and forth on the line. When a time ticket is lost, the person losing it should be required to file with the general accounting officer a good and sufficient bond of indemnity before a duplicate can be issued.*

The endorsement of the payee on the back of a ticket is a sufficient receipt for the payment thereof.

It should be kept in mind constantly by those who pay time tickets that no one except the person in whose name a time ticket is drawn is authorized to endorse the same, unless he does it as an administrator, legal guardian, or possesses a power of attorney, in which case the authority should be pinned to the ticket. Any endorsement of a ticket by an unauthorized person is fraudulent and renders the person making it liable to prosecution, and no credit can be allowed for paying such a ticket.†

CANCELATION OF TIME TICKETS.—In order to limit responsibility and for other necessary reasons, time tickets not paid within thirty days of their issuance are, according to the express terms of the instrument, made void. Therefore, when they remain in the hands of agents and others unpaid after the expiration of thirty days, they should be canceled and

* See Form 77, Appendix D.

† This rule should apply also to vouchers, drafts, checks, and other instruments requiring the receipt or endorsement of the payee.

forwarded to the paymaster. The form of cancelation should be by noting "Canceled; not called for" across the face of the document. This certification should be dated, and signed by the person making it.

Upon its receipt the paymaster should erase the words "Time given" from the pay roll and note thereon the date the ticket was canceled by him, as say, "Time ticket canceled May 31st, 19—;" he should furthermore mark across the face of the ticket "Canceled May 31st, 19—," and sign his name thereto.

He should then destroy the signatures to the ticket and forthwith return it to the person who made it. It is the duty of the latter to make a notation on the record to the effect that it has been canceled and place the original ticket in the time ticket record book.

Afterward, in the event the person in whose name the ticket was made calls for the same, he should be referred to the paymaster who should adjust the account.

LETTER OF ADVICE AND IDENTIFICATION.*—This form should be used to notify the paymaster in those cases when the pay roll has left the hands of the person who signs the letter, that the bearer, whose name appears on the roll, is entitled to his pay without awaiting the usual pay day. It may also be used for the purpose of identifying a person to whom wages are due.

It should never be used in those cases where a time ticket has been issued.

It is of especial value in the case of laborers and others who have left the service and are required to be identified before being paid.

It should recite the name and number of employe and name of pay roll.

A letter should never be given to a person whose pay, or any portion thereof, is to be withheld for any reason, unless the amount to be withheld is plainly noted thereon.

A record should be kept of all letters issued. A letter should not be delivered to the payee until it is both signed and countersigned. The regulations governing time tickets in this connection should be observed.

Whenever access to the pay roll can be secured, it should be marked "Letter given" before the letter of identification is delivered to payee. In the event this is done, the fact should be duly certified to in the place provided on the face of the letter.

When this form is used as a letter of identification, the officials signing and countersigning it should require the per-

* Form 72, Appendix D.

son to whom it is given to endorse his or her name on the back of said letter. This should be witnessed by some disinterested person known to the officers of the company; neither the person signing or countersigning the letter should act as a witness. Afterwards, when it is presented for payment, the disbursing office should require that it should be again endorsed by the person presenting it. If the two signatures are the same, it will afford corroborative evidence of the identity of the party. If the payee cannot write, he should make his mark, which mark should be witnessed in manner as provided for above.

The holder of a letter should be advised that its loss may involve the loss of the amount, as it is made good to bearer. Letters, whether endorsed by mark or otherwise, should be presented by payee personally, as in other cases.

ORDER ON PAYMASTER.*—In the exceptional cases where it may be necessary, or the interests of a company render it desirable to facilitate the issuing of an order by an employe for his pay, the officer immediately superior to the said employe should forward the order, with a statement of the facts, to the paymaster, who should, after investigation, mark the pay roll "Order given."

When an order is given it should be drawn on the blank provided for that purpose, and should be presented at the proper time and place for paying the wages of the person on whose account it is issued. Orders on the paymaster should not be recognized as negotiable paper, and no one in the service of the company should traffic in them.

The exceptional circumstances under which orders are issued prevent their being recognized as commercial paper, their issuance is not a matter that a company can control; it cannot, consequently, guarantee their payment, nor assume any liability for them whatsoever.

No order should be accepted or countersigned by any officer or agent of the company, except the paymaster, and then only in the exceptional cases specified above, and after he has marked on the pay roll, opposite the person's name, "Order countersigned."

When payment is made by check and for any reason it is impossible for an employe to present himself personally before the officials from whom he usually receives his wages, the check should not be delivered to another person except on a written order, signed by the person in whose favor the check is drawn, and after the official has satisfied himself that the person presenting the order is entitled to receive it.

CLASSIFYING EXPENDITURES OF LABOR.—In order to under-

* Form 73, Appendix D.

stand accurately the questions attending the employment of labor, its extent and purpose must be known. This, when the labor is diversified, requires that it should be systematically classified, the subdivisions being so minute as to afford an accurate and intelligent digest of the whole.

The subdivision should not only specify the nature of the work, but its location and cost, being altogether so explicit in regard to details that it only remains to study the same in order to understand the full scope and purpose of each expenditure.

It is largely for this purpose that operating expenses are carefully subdivided; that disbursements for construction are minutely classified; that accounts are opened with each article or group of articles manufactured, and for other purposes. The classification should permit of the details of cost being accurately known, so that by analysis and comparison the relative economy exercised may be judged.

So far as the exigencies of accounts will permit, without undue expense, it is designed that everything that enters into the cost of a thing shall be charged thereto. Thus, the cost of handling material, the outlay for the construction or repair of a building, platform, yard, fence, bridge, culvert, engine or car should so far as practicable be charged thereto. When, however, the expense of accounting is greatly increased by too minute a subdivision of expenses, and the value of the information thus obtained is not commensurate with the outlay, it should not be attempted, the design being to make the method of accounting subordinate in every case to the value of the same, and never in any instance to incur expense that is not justified by the use made of it.

So far as agreed upon, the subdivisions of expenditures should be scrupulously observed, so that returns may not be misleading as regards cost of particular things, and otherwise lose their value for purposes of comparison.

In addition to the expenditures of a company for operating, construction, manufacturing and similar outlay, more or less work is performed for others for which a company is entitled to receive pay. Accounts are required to be kept of all such labor so that it may be brought to the notice of the accounting and financial officers of the company, in order that the same may be duly and clearly recorded and the amount collected.

In order that all these things may be successfully accomplished without confusion or failure, it is of the greatest importance that those who have the keeping of time of employes (and the distribution of material and expenses as well) should be familiar with the various classifications of the company,

and the machinery by which they are carried into effect; also the general and specific objects that such classifications and accounts are designed to accomplish. This requires that they should not only study the mechanical appliances, but the theory and principles that the forms are intended to carry out. This study will enable them to perform their work more intelligently and will sharpen their appreciation of its needs so that better knowledge of the conduct of accounts and greater efficiency therein will grow out of it.

In order to classify the expenses systematically and preserve a clear and permanent record of the same, distribution books are provided.* In these, accounts are to be opened for each expenditure having a separate identity in the classified list, such accounts being entered in their due order and sequence, care being taken in every case to use the designation prescribed by the rules governing the same.

In writing up these accounts, the record throughout should be so clear an exposition of the subject that it may be fully understood and analyzed without correspondence or further reference to the person returning it. Thus, the items of each account should be given, including the nature of the services rendered and amounts for each separately; also the total cost or aggregate of all the items. In giving the name of an account, especial care should be taken to make it so explicit and clear that it may be easily identified, so that all the details of cost may be collected from the various books in which it is mentioned.

In classifying expenditures for labor (and for material expenditures as well) it should be understood that the work is not to be performed at random in any instance, but according to preconceived rules and regulations; if the disposition of an expense is not known or not clearly indicated by an analogous account, information should be asked of the accounting officer; this will not only insure uniformity, but will also enable a company to supply omissions or correct inaccuracies in its classification.

In further explanation it may be said that in no case should the duty of distributing the labor of an employe or class of employes be governed by their general duties, but it should be specific in each instance; thus, the wages of engineers, when engaged in shops, should not be charged to the account known as "engineers and firemen," but to the thing upon

* These distribution books are written up by the person who keeps the time or in the office of the official to whom the time books are sent, as specifically directed in each case; they may be used at the general offices as journal vouchers, the totals only being entered on the general books.

which they are engaged in the shops, the same as machinists and carpenters. This rule also applies to every branch of the service, care being taken to classify the work according to the particular thing done and not according to the general duties that the employe performs. This is necessary in order to enable the management to understand clearly the cost, relatively and otherwise, of each thing for which money is expended.

THE DISTRIBUTION OF LABOR BOOK.*—The distribution of labor is designed to be kept on loose sheets; it is quite as convenient in this way as it is to keep it in a book; at the end of the month an impression copy is taken of each of the sheets by the timekeeper. In this way he is put in possession of a perfect record at little cost. Afterward, the sheets are bound in book form. They then constitute the "distribution of labor book."

A separate account should be opened in this book with each account upon which labor has been expended. It will thus show not only the source of the expenditure, but the details thereof, and the aggregates as embraced in the recapitulation. It is posted from the time books.

In some cases, however, it is found desirable to provide printed forms for distributing labor, so as to reduce the clerical work to the minimum. This is so in regard to track and station labor, and for men engaged in repairs and renewals of bridges, buildings, fences, crossings, platforms and yards; the number of men engaged does not justify the employment of a timekeeper. The classification of such labor is comparatively simple, and may be condensed in the time book to a greater extent than is possible in case of machinists and carpenters engaged about a shop; the great number of the latter, and the widely diversified work upon which they are engaged, require comparatively elaborate bookkeeping.

The distribution of labor book is designed for use in writing up the general books of a company. It should, therefore, be forwarded to the accounting officer. Those who compile it should not keep it in their possession longer than is necessary; the utmost celerity should be exercised. It should be sent forward from small shops and where the work is slight on the fifth of the month; at larger shops and for divisions as early as the ninth.

It should be remembered, in this connection, that the value of statistics of this kind is largely dependent upon their early compilation. The earlier the details are known, the more valuable they are to a management. This requires that every-

* Form 74, Appendix D.

one who has anything to do with the distribution of labor or the examination of the accounts should act promptly and expeditiously.

A distribution of labor book should be returned by each shop where pay rolls are made. Such a book should also be returned by those having charge of the general accounts of the several divisions. Thus, the time books of the track forces on a division should be consolidated and copied into one distribution of labor book; the same rule should be enforced in regard to the time and distribution books for bridge and building department, engineering department, etc. The distribution of station labor and train forces on each division should also be consolidated in one distribution of labor book.

The distribution of the time of engineers, firemen and dispatchers should be inserted in the distribution of labor book for the shop at which the pay roll of engineers, firemen and dispatchers is made.

Labor should be charged to the account upon which it is expended, in the month it is expended.

Accounts should be opened on the distribution of labor book in the order prescribed by the accounting officer; a recapitulation of the whole should be given at the end.

In opening accounts, sufficient space should be left to accommodate all the items for each account for one month.

A separate distribution of labor book need not be rendered for each pay roll. Several pay rolls may be grouped in one book, but the aggregate amount of pay rolls thus entered should agree with the total amount of the distribution book.

The distribution of labor book should in every case specify the name of the time book or books from which it is compiled, so that it may be compared with the same in detail.

Under headings embracing such items, a sub-account should be opened for each bridge, culvert, viaduct, building, dock, wharf, ferryboat, locomotive, stock yard and dining car for which expense is incurred.*

A separate account should be opened with each individual, firm or corporation against whom a charge is incurred. It is the duty of the person returning a book embracing accounts of this kind to attend personally to the proper recording and rendering of bills against such persons.

The wages of employes engaged in the manufacture of material should be charged to the cost of the material upon which they are at work.

Much of the information contained in the distribution of

* The several charges under the respective heads as noticed should be summarized and the total of each carried to the final recapitulation at the end of the book.

labor book may be written up in advance of the closing of the accounts for the month. Thus, the headings may be inserted, and the name or number of employe, kind of service and folio of time book. These details may be gathered from the distribution book for the preceding month and from the time book of the current month. If inserted in this way in advance, work will be greatly facilitated, and it will be possible to complete the distribution of labor book earlier than would be possible if the whole had to be written up after the close of the month.

CHAPTER XXVI.

ACCOUNTS AGAINST PERSONS FOR MATERIAL SOLD, LABOR PERFORMED, ETC.

[NOTE.—These accounts represent charges against individuals, firms, and corporations for material sold, labor performed, expenses incurred, and for other special things, including proceeds from sale of unclaimed and damaged property, carcasses of animals killed, hides, pelts, and similar items. On some roads these accounts are called "Various persons' accounts." The name is not material. They embrace all accounts save those for freight charges, tickets, express, mail, car service, and other traffic. They are embodied herein because they are more or less mixed up with the material and labor accounts, and concern, more or less, the officers and employes who handle material and labor.]

There are, in connection with the receipts of railroads, certain kinds of collections of a special nature. These collections are not uniform or regular in their recurrence, like those connected with the transportation of passengers, freight, mail, express and excess baggage. The regular traffic earnings of a company fall within the domain of particular departments, and particular and fixed methods and forms are provided for handling them. But this is not the case in regard to special collections; in one case the latter will be for old ties, in another for the pelt of a steer killed, in another for the breaking of a station window, for damage to a car, for the sale of old material, a blank book, a strip of right of way, a tax rebate, a worn-out horse, a piece of chamois skin, a barrel of oil, work performed by a company's employes, an expense incurred in behalf of someone, a remittance to the conscience fund, and so on. Each case as it arises is in a measure special in its nature, and new to the person interested. In the majority of instances the person who makes the collection is not one of the regular agents or collectors of a company, and, as a rule, no ledger account is kept with him by the company. To open such an account would be to fill the books with a multitude of names without securing either clearness or responsibility; there are various ways of avoiding this dilemma. The way is not particular. That suggested here is to require the person who makes the collection to remit to the credit of the chief of the department in which the collection is made; thus, collections made in the land department are remitted to

the credit of the official in charge thereof; in the tax department to the chief thereof; in the departments presided over by division superintendents and others, to the chiefs thereof; and so on. All collections made at shops are remitted to the credit of the storekeeper thereof. Afterward, a bill is made against each official for the amount of the various collections remitted to his credit. In order to advise such officials, a statement of each collection is sent him by the person making it. These statements, moreover, enable him to note the merits of each case, also whether any collection is omitted or not. It is made the duty of officials to look after these collections in their several departments, also to see that bills are made to cover them.

The difficulty that has been experienced in handling such accounts as I refer to is to group them so as to fix the responsibility; to assign to particular officials the duty of looking after them. Thus, if John Smith, a track foreman, collects $1.30 for the sale of an old gate, it must be made the duty of someone to see that he remits the money and otherwise accounts for it. Who shall do this? The treasurer? Or accounting officer? Neither. Because neither of them has any facilities for knowing that a gate has been sold or that money has been collected for it. Who is the proper person, then? Manifestly the officer of the company who is familiar with the transaction, whose duty it is to know of it. In this particular instance it would be the roadmaster or division superintendent. Such being the case, it is made the duty of this officer (under the accompanying instructions) to see that the money collected for the gate is remitted to the treasurer, and that at the end of the month this collection, with all others remitted to the credit of the officer, are incorporated in a statement of account against him, also in a bill against him for the gross sum. The various persons' accounts of a company are made up largely of occurrences similar to the sale of the gate by Smith. They must be protected the same as the collection of freight and passenger charges are protected.

With this explanation of the theories and practices that attend the operation of various persons' accounts, the subjoined rules will be more clearly understood than would otherwise be the case.

No uniform name has been devised for designating the special accounts under consideration; they are termed here "various persons'" accounts.

In order to define as nearly as possible the course of certain various persons' accounts the following specific rules should be observed, viz.:

Money collected by agents, trackmen and others, for hides, pelts, tallow, carcasses of animals, road material, old ties,

damage to the company's property, and kindred charges occurring on the line, should be embodied in the returns of the superintendent or other official in charge of the accounts for the road (i. e., the person who authorizes the collection and within whose department the transaction occurs), and the money should be remitted to his credit.

Cash collected on accounts of fines imposed by the United States Post Office Department should be remitted to the credit of the division superintendent and the amount included in the bill against himself at the end of each month.

Money collected on account of the sale of damaged, over or unclaimed freight should be remitted, with a detailed statement of the same, by the person making the collection, to the credit of the general claim agent. If there are charges on the property thus sold, the amount of such charges may be deducted from the proceeds of the same before remitting the money. In making the bill, however, at the close of the month, the gross collection should be shown, less the deduction.

Money collected on account of the sale of damaged, over or unclaimed baggage should be remitted, with a detailed statement of the same, by the person making the collection, to the credit of the general baggage agent. If there are charges on the property thus sold, the amount of such charges may be deducted from the proceeds of the same before remitting the money. In making the bill, however, at the close of the month, the gross collection should be shown, less the deduction.

Money collected in connection with the land department, for lands and town lots, should be remitted to the credit of the land department, with a detailed statement of the same, by the person making the collection.

Money collected for rents, sale of old houses and kindred property, under the direction of the land commissioner, should be remitted to his credit.

Moneys collected by superintendents, train masters, agents and others, as deposits for badges, switch keys, car keys, etc., should be remitted to the credit of the division superintendent and he should be notified of each amount remitted, so that he may include it in the monthly bill against himself. Deductions made on the pay roll on account of above items should be made in favor of the paymaster, and bill made against the paymaster therefor.

When money is paid to an employe leaving the service to redeem badges, switch keys, car keys, etc., the official making the payment should also take a receipt for the amount and forward to the division superintendent, who will make cash

vouchers monthly in favor of each of the officials making such payments, attaching the receipts to the vouchers.

All cash collected on account of various persons should be remitted directly to the general accounting officer.

It is the duty of the official who has immediate supervision of the various persons' accounts of any department or storehouse to see that an itemized monthly return is made to him of the same.

It is not intended, however, that the money should be remitted through him to the treasurer; it should be remitted directly as stated.

Remittances should not be sent by the hand of an employe but should be sent by express directly to the treasurer or should be deposited personally at his office.

A cash slip, or statement of account, should accompany each remittance, giving the name of the person or official to whom (under the rules) it should be credited, what the collection is for, date collected, from whom, etc. It is the duty of the official receiving the money to send a receipt forthwith to the person to whose credit the amount is placed; in the event this is not done promptly inquiry should be made for it.

No material or property should be sold to, or labor performed for, various persons, except upon the written order of the proper officer.

No material or supplies should be delivered or shipped from a shop or storehouse (except for the company) until an order to that effect, signed by the storekeeper and countersigned by the master mechanic or foreman in charge has been made and filed with the delivery clerk. It is also the duty of both the storekeeper and master mechanic or foreman to see that a charge is made on the distribution books to cover all material or supplies shipped away or sold. Similarly no labor should be performed for anyone but the company, except upon the joint written order of the storekeeper and master mechanic or foreman in charge. When labor is thus performed it is the duty of both the officials in question to see that a charge is made for it on the distribution books.

Whenever practicable, collection should be made at the time the charge is incurred.

In making the collection (and in making the charge as well) care should be taken to add the authorized percentage of profit (if any), also amount (if any) to cover the wear and tear of tools, machinery, etc.; the amount of this extra charge should be credited on the distribution books to premium account.

The amount of percentage of such premium should be determined by the official authorizing the work or transaction.

Heads of departments who direct a collection to be made

on account of various persons, or within whose department a collection is made, should have the money remitted to their credit; in this way the collections of each department of the road will be grouped and the number of accounts restricted as already described.

In order to restrict the number of charges as much as possible, a storekeeper should make only one bill monthly against a person, firm or corporation, unless it is advisable to make collection oftener in order to avoid risk or loss.

All charges for fuel sold should be embodied in the general fuel report of the person making the disbursement, and the same details given in connection with such charges that are required for other various persons' accounts.

Collections for fuel made by those in charge thereof should be remitted to the credit of the officer against whom the charge (in such case) is made in the monthly fuel report. It is the duty of this officer to make an itemized bill against himself monthly for the amount thus remitted to his credit.

In issuing instructions to agents and others in reference to a collection to be made to the credit of some one else, care should be taken to give the name of the person to whom the money is to be credited, and to ask in each instance that the sender shall advise when the remittance is made.

When money is remitted by one person to the credit of another, the person making the remittance should inform the person entitled to credit forthwith by letter, so that he may take up the same in his accounts and may know that the money has been remitted.

In opening an account with himself on a distribution book, and in making bill against himself for various persons' accounts, the storekeeper or official should give each charge, viz.: name of person from whom the money was collected, and all other details incident thereto, such as date, place, what for, amount, by whom remitted, etc.; thus, if fifty collections are made in a department or at a particular storehouse during a month, for material, labor, hides, carcasses of animals, etc., the persons making the collections should remit them to the credit of the storekeeper or official in charge. Each official should open an account on his distribution book with himself, in which he should specify in detail the accounts collected; it being understood that all charges for material sold or labor performed on account of various persons, taken cognizance of by those who render a distribution book, should be embraced therein:

The regulation requiring that collections made on account of various persons should be remitted to the credit of department officers or storekeepers should not apply to various persons' bills collected by the treasurer. In such cases the charge

should be made directly against the individual, firm or corporation, and a bill made accordingly. All charges, moreover, that originate with officers who do not render a distribution book should be made in this way unless otherwise directed; in such cases a certified bill should be made in duplicate by the officer conversant with the transaction; these he should forward to the proper officer for entry upon the register and for transmission to the general accounting officer.

Officials who render a distribution book should open an account on such book, first, with the official to whose credit amounts have been remitted on various persons' account as already described; second, with each various person with whom there is an account, giving full detail of charges to each; following these a summary should be made, stating the name of each account and the total amount thereof; this summary should in turn be footed and the total carried to the final recapitulation, being inserted therein under the head of "Material—various persons." In the summary, the page of the distribution book on which the credit is allowed should be given; if for material the fact should be noted.

For all material sold and labor performed for other than carriers, a bill should be made and forwarded as directed, at the time the charge is incurred;* in the case of carriers, statements or bills should be rendered monthly or as may be most conducive to quick and amicable settlements.

Accounts due the company should receive immediate attention from all through whose hands they pass. Bills should be made, verified, entered and approved without delay. Immediate attention should also be given to their collection; delay in collecting bills is to be deplored. It evinces lack of appreciation of proper business methods, and sooner or later occasions loss.

It is made the duty of all who are in any way responsible for various persons' accounts to see that so far as possible no bad debt is incurred or loss occasioned through neglect to collect promptly. In furtherance of this, collections should be made at the time if practicable; in other cases prompt notice should be forwarded to the treasurer when any risk is incurred, so that he may act advisedly. It is desired that cash should be paid at the time, especially when the debt is incurred through the desire of a company to oblige the person.

In reference to accounts against various persons that spring up in connection with the duties of employes along the line of the road, such as trackmen, bridge and building men, station and train employes, etc., they should be required to render prompt notice to the officer through whom the returns

* Form 78, Appendix D.

are made, of any debt incurred, so that no unnecessary risk may be run.

Collections for scrap or old material sold by the company should be made by the general accounting officer under direction of the officer who effects the sale, so that the labors of the latter may not be embarrassed in any way.

In order to facilitate the collection of accounts against various persons, every detail likely to assist in this direction should be given; such as the name of the person who ordered the material or authorized the labor, to whom the material was delivered, etc.

When deductions are made from pay rolls (for account of the company) a bill should be made by the official conversant with the transaction, against the paymaster (whose duty it is to collect), to cover the deduction. The bill should give full explanation of the cause of deduction. The amount of this bill should be noted on the first sheet of the pay roll.

Bills against railroads and other carriers should be formally certified as correct by the officials directing the charge. It is desirable in case a charge is liable to be disputed, that the amount and correctness of the account should be accepted by the company interested before it is formally brought upon the distribution books or into the accounts, and in cases of this kind satisfactory results are more likely to be achieved if the correspondence connected with the claim is carried on by the official immediately conversant with the facts, than if conducted by the treasurer. For this reason, no charge should be made on the distribution books against any carrier (when there is a possibility that such charge will be disputed), until correspondence has been had in regard thereto with the company interested by the operating officer conversant with the facts. But no charge that is right and proper should be waived if the result of the correspondence does not secure its admission by the company interested. The object in withholding doubtful charges is to prevent the books from being encumbered with disputed and uncollectible accounts, not to waive any collectible claim.*

* METHOD OF ACCOUNTING FOR REPAIRS OF ROLLING STOCK BELONGING TO OTHER COMPANIES USED IN THE INTERCHANGE OF TRAFFIC.—Daily reports should be sent to the superintendent of the car department of all labor and material used or expense incurred on account of rolling stock belonging to other companies, firms or individuals. This report should give the number of car, name of owner, items and cost. After these reports have been examined and approved, they should be forwarded to the general storekeeper for the purpose of making the bill.

Whenever there is any doubt as to the justness of a charge of this kind, or as to whether it will be paid or not, the superintendent of the car department should, as directed, correspond with the company interested and agree with it in reference to the charge before making a bill for or rendering a statement of the expenditure.

For this reason, and for the purposes of simplifying accounts, all

All bills against individuals, firms, and corporations (including carriers), should be made in triplicate. The original should be sent by the local official direct to the officer whose duty it is to make the collection. The duplicate should be forwarded to the officers designated to examine same for approval and for transmission by them to the proper officers for audit and collection. The triplicate should be retained as an office record.

In making a bill care should be taken to give correctly the full name of the party against whom it is made; also the location (post-office address) of the office to which same should be sent for collection should be shown.

No one except those regularly authorized, may collect money on account of a company, or receipt therefor.

A formal receipt is required to be given in every case at the time money is collected for or on account of a company; it should be dated and signed, and should state specifically the purpose for which it is given. This rule applies to every officer connected with the company as well as to every employe. Its rigid enforcement is in accordance with good business practice, and serves to protect the company, the person who gives the receipt and the person who receives it.

In reference to "conscience money" received by a company: when not remitted directly to the treasurer it should be turned over to him, with all the attendant facts. A various persons' bill should be made for each amount thus remitted.

If the name of the person making the remittance is known, the bill should be made in the name of such person. If not known, it should be made in the name of the person to whom the money is remitted by the sender. This will preserve a perfect record of the transaction and is preferable to the method of crediting the cash directly to the account that had originally suffered (when known) from the act of the remitter. Bills for conscience money should be credited to the specific account affected when indicated by the sender; in other cases it should be credited to miscellaneous earnings.

The following details should be observed in entering various persons' accounts on the distribution books for material and labor, viz.: It may sometimes occur that it is not possible or practicable to make the charge in the month in which the

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labor and material used or expense incurred on rolling stock in use belonging to other companies, should be charged in the distribution books the same in all respects as if the rolling stock belonged to the company making the repairs.

The return of expenditures on equipment belonging to other companies should give the name of the company, articles, rate and amount, with full particulars in reference to the nature of the repairs, and the cause therefor, so that the officer referred to may be able to act intelligently in disposing of the charges.

transaction takes place. Indeed, it may not be known at that time to be a various persons' transaction. In that case the amount would manifestly be charged to some other account. In cases of this kind tne account that was originally charged should be credited when the transaction is finally entered and returned in the monthly statement. It is desirable, however, for obvious reasons, that, whenever possible, the charge against various persons should be made on the books in the month in which it occurs. Charges for labor should be entered on the distribution of labor book; charges for material should be entered on the distribution of material book. Whenever a charge occurs for material, which material does not stand charged against the storehouse or department making the return, like the sale of old ties, sand taken from pits, hides, pelts, broken windows, or damage to the property of a company, the proper operating expense account or the account originally charged with the thing for which collection is made should be credited in the distribution book. Thus, if a superintendent were to collect money for damage to a passenger station he should enter the amount on his distribution of material book under the head of "various persons," as already directed, and deduct it from the amount charged during the month to "repairs of buildings." In this way the various persons' account would be charged and the proper account credited. In the event there should be a credit to an account for which there is no charge, say for right of way, a special account should be opened in the distribution book for "right of way" and the amount to the credit of such account duly stated therein.

Whenever it is desired to group in one bill the charges that arise simultaneously against a particular individual or carrier at different places, the officer who authorizes the charges, or under whose authority they occur, may designate who shall make the bill, notifying all others to invoice their charges to him, so that he may sum up the whole in one account. This rule is not imperative. It is intended to meet those cases where the company is carrying on experiments for others in the operation or construction of machinery, or where it is necessary to group together the charges in order that they may pass under the immediate supervision of some official. But it is not intended to alter the rule requiring charges against persons or railroads to be reported to the accounting officer monthly, so that the same may be charged on the general books as they occur.

When work is in progress, the expense of which is to be borne wholly by another corporation, firm or individual, or jointly by the company and another corporation, firm or individual, the proportion chargeable such corporation, firm or

individual should be entered under the "various persons'" account each month regardless of whether the bill is to be rendered monthly or at the completion of the work. If the charges extend over several months and it is found when work is completed that an adjustment of the previous month's charges is necessary, the corrections may be made in the month in which the final charges are entered and the bill made. When charges are made to "various persons'" account and no bill is to be made in the month in which they are entered a notation should be made on the distribution book that bill will be made later.

If instructions are faithfully observed, loss will rarely, if ever, occur in connection with the various persons' accounts. It is designed that no material or other property shall be sold, labor performed or expense or obligation incurred for anyone except under direction of an authorized officer of a company; that care shall be exercised not to incur bad debts; that accounts shall be collected at the time the indebtedness is incurred; and finally, that all collections shall be transmitted to the treasurer upon the day on which they are received, or if this is impossible, then upon the succeeding day.

In summing up the various persons' accounts all bills should be entered at headquarters upon a register provided for that purpose.* They should be numbered consecutively, after which they should be forwarded to the proper officer for final approval.

Accounts originating at shops, storehouses or road departments, where a distribution of material book is kept, should be credited, when entered on the various persons' register, to "Material—various persons." Accounts originating with other officials of the company, who have no occasion to render monthly distribution books of labor and material, should be credited on the register to the operating account originally charged with the labor, material, or outlay, whatever it may be.

In speaking of credits in connection with bills (charges) against various persons, it will be understood that in railway accounting there must be a credit for every debit. Thus, if there is a debit against an individual for material sold him, a bill is made against him which constitutes a charge: the amount of the bill is credited to the account affected. Thus, every bill against various persons implies a corresponding credit; and so every voucher to the credit of anyone (for sums due by the company) implies a corresponding charge against some account.

One reason why various persons' bills are credited to the

* Form 79, Appendix D.

storekeeper upon the register at headquarters, instead of to the account directly affected, is because the latter is not always known at the time; also because the storekeeper himself is entitled to credit if the thing disbursed is material or labor, as he stands charged with the gross amount of these. The credits for various persons' bills are in turn credited by storekeepers to the accounts to which they belong. The same is true in a corresponding sense in regard to vouchers. Storekeepers should be advised of any debits or credits affecting them.

The register of various persons' bills should not be closed until the tenth day after the end of the month, when the results as entered thereon should be summarized for entry upon the general books. It is desired so far as practicable to embrace all accounts in the month in which they belong.

At the end of the month a summary should be made of the various persons' register, showing the total amount of bills entered and the accounts to which they are creditable, giving the name and amount of each credit. A similar summary is required to be rendered for the register of audited vouchers.* These summaries may be copied into one book, the entries for various persons being a history of amounts due the company; the other a history of amounts due by the company. The two statements being thus brought together, only the balance or difference between them need be posted on the general books. A common distribution of material book will be found convenient for summarizing these important accounts.

A ledger account should be opened at headquarters for all charges against various persons.

A journal and double-entry ledger should also be kept by every storekeeper who has such an account. The expense this will engender will be slight compared with the safety it will insure. The object sought is to secure a record that must be formally closed in every instance and that cannot be overlooked or forgotten.

A ledger account should therefore be opened when labor is performed, material sold or expense incurred for an individual, firm or corporation. The parties against whom the account occurs should be formally charged on this ledger. When the work is completed, and the charge has been finally and properly disposed of, the ledger account should be closed.† In making this closing entry or entries at storehouses, particular care should be taken to give the month and folio of the distribution book in which the account is returned to head-

* I. e., bills due by a company.

† In the case of storekeepers this would be when it has been returned to headquarters in the manner prescribed; at headquarters it would be when the account was paid or otherwise formally disposed of.

quarters or otherwise disposed of. This method of treating various persons' accounts will prevent the possibility of a charge against anyone being overlooked, a thing likely to occur in case an account ran through two or more months, or if the rendering of it was not coincident with the debit.

Generally speaking, accountants everywhere will find it to be a wise precaution to open a double-entry ledger account wherever an account against anyone occurs (that might otherwise be lost or overlooked), closing it only when the account is paid or finally disposed of. There is always danger otherwise of charges of this nature being lost. It is the peculiar merit of double-entry bookkeeping that it prevents such lapses: it is the only thing that does. Through its operation every account stands till formally closed, and attention is called to it each month, when the balance sheet is drawn off, so that if an account is overlooked at one time, it is sure to secure attention at another. No book or system ever devised as a substitute for double-entry bookkeeping secures this. Thus, if a car is to be rebuilt that may require several months, or an account is opened that may not be closed for some time, this ledger will pick up the several fragments of the account as they arise and bring them together in one place, so that when the whole is completed the accountant cannot avoid reviewing the same to see whether it has been settled or formally disposed of.

When an order is received at a shop or storehouse by which a charge is to be incurred against an individual or corporation, a record of the matter should be made forthwith, so that it may not subsequently be forgotten or omitted. For the purpose of this preliminary record, a common blotter or day book may be used. When the account is formally opened on the ledger, this preliminary entry should be canceled as an evidence thereof; until so canceled it must not be overlooked or forgotten.

CANCELATION OF VARIOUS PERSONS' BILLS.—In the event it is desired to cancel a various persons' bill, an account, or an item in an account, due from an individual, firm or corporation, satisfactory reasons therefor should be written on the face of the bill or statement of account, or must be attached thereto. The statement should be signed by the officials certifying to the authenticity of the original account. This statement will form the basis for correcting the account on the general books of the company, and should be filed as a voucher for such change. This does not apply to traffic accounts, which may be corrected at any time by the officials in charge.

In canceling various persons' bills, the amount should be

charged on the general books to the account originally credited on the register of various persons' bills.

When various persons' bills which have been credited to "Material—Various Persons" are canceled, an entry should be made on the distribution book of the storekeeper who accounted for same, in the following manner: The amount of the various persons' bills canceled should be deducted from the total amount of "Various Persons' Accounts" for the month, and the operating or other accounts which were first credited should be charged with the amount.

Specific reference should be made in the distribution book to each various persons' bill canceled, and the reason for cancelation given. Notice will be given by the general accounting officer monthly of all bills to be canceled, and no cancelation entries should be made on the distribution books other than for bills reported by the general accounting officer.

CHAPTER XXVII.

FISCAL REGULATIONS CONNECTED WITH VOUCHERS AND OTHER PAYMENTS, INCLUDING INTEREST ON BONDS, SINKING FUNDS, ETC.

[NOTE.—As this chapter directly concerns disbursements, it finds an appropriate place here. Much of it concerns the station agents of a company, who have little to do with expenditures generally. I have accordingly incorporated the bulk of it in another volume of the "Science of Railways" series, which relates almost wholly to the duties of agents.]

VOUCHERS.*—A voucher is a certificate of indebtedness issued by a company, giving the name and residence of the payee, the particulars of the claim, and the amount thereof.

Each voucher should recite the name (in full) and address of the payee, and should give a detailed statement of the purpose for which it is made, and the date and amount. It should show upon its face, or in the place designated under the filing, the account or accounts to which it is chargeable.

All papers or correspondence that belong to or are in any way necessary to explain the reasonableness or authenticity of a voucher should be attached to it. All the facts in relation to it should be explained either upon its face or in the papers that accompany it.†

A voucher is required to be made for material purchased; for service performed for a company when not embraced in the pay roll; for amounts due for injuries, damages, property bought or expense incurred on a company's behalf. Vouchers should be made in favor of the person, firm or corporation to whom the company is indebted. In case of amounts due the national or state governments, counties, cities, townships, villages, and the like, vouchers should be made impersonally in favor of the official entitled to receive the money, thus: Treasurer of the United States; Treasurer (or Collector) of Greene County, Iowa, etc.

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* See Form 80, Appendix D.

† Many companies make a copy of the original voucher; the copy they use in making the payment; the original they file away with the papers attached. There are many things in favor of this plan. I have, however, always been accustomed to use the original voucher in paying, and that is the plan outlined in my books.

Vouchers upon which payment is made for materials should in all cases be made by the purchasing agent, whether the request for the same is forwarded before or after the goods are bought.

No voucher for the payment of supplies of any kind should be certified to or passed for payment without the written acknowledgment of the storekeeper that the property has been received, inspected and accepted.

Vouchers for material should specify the date the material was purchased, and the number of the requisition on the purchasing agent on account of which it was bought.

Vouchers for labor should contain a statement of the time worked, the place, rate and date.

Where coal, rails, lumber, scrap or other material is handled by contract, payment for such services should be made by voucher. The voucher should be made on the first day of the succeeding month. It should give date of contract, rate, and all other information necessary to a complete understanding of the transaction. It should be vouched for by the proper official and treated in all respects as other vouchers.

Vouchers for traveling expenses should give each item, and date and place the expense was incurred.

Officials and agents of a company who, in traveling on official business, pay for transportation over lines of foreign companies, should make return on separate vouchers of all sums so paid. In each case the route of travel should be clearly stated, giving the name of the railway or other transportation company used. If coupon tickets are used, the name of each company included therein should be stated.

The division superintendent should make vouchers for the relief of agents, when in his judgment it is proper to do so, for money stolen or destroyed by destruction of office by fire or otherwise. He should also make vouchers to relieve agents for petty payments they have been authorized to make for feeding or care of delayed or injured stock, or to meet similar emergencies at stations.

In paying vouchers it is not always convenient or practicable to read the papers attached; consequently transfer orders may be overlooked, unless a notation is made on the back of the voucher calling attention to them. In the event, therefore, that an order is attached, the fact should be noted by the person making the voucher.

Vouchers should, so far as possible, be charged on the books in the month in which the debt is incurred.

Errors in name or initials of payee, place of residence, description of claim or amount thereof, cause much inconvenience, and are the occasion of expense and delay in the payment of the account. They are also liable at any moment

to involve the company in loss if not discovered and corrected in time. Mistakes of this kind are frequently the result of ignorance or inadvertence upon the part of the maker of the voucher, but more often the result of carelessness. It is highly important, therefore, that especial care should be exercised in making vouchers to see that the name of the payee as given is technically correct, and if necessary, vouchers should be withheld by the maker until satisfactory inquiries in this respect can be made.

The filing on the back of the voucher should be filled in by the maker, before sending same to headquarters.

Each voucher should be given a number, beginning with No. 1 the first of the fiscal year; it should be entered at the headquarters of the company on a register provided for that purpose.* The register should contain a brief account of each voucher: number, name of payee, character of claim, amount and the account to which it is chargeable. At the end of the month a statement should be drawn off from this register, showing the total amount of vouchers entered and the things to which they are chargeable, giving the name and amount of each charge. A similar statement should be drawn off from the various persons' register. These statements may be entered in one book; one, the entries for vouchers, being a history of debts incurred for material and other things; the other, a history of credits. The two statements being thus brought together in one book, only the balance or difference between the debits and credits need be posted on the general books. A common distribution of material book will be found convenient for summarizing these accounts.

Officials who render a distribution book should open an account on such book with "Vouchers Chargeable to Storekeepers." Under this head should be entered the date and number of each voucher, name and address of payee, what it is for, and the page on which the distribution of same may be found. The total of vouchers thus entered should be carried to the final recapitulation of the distribution book as a credit (red ink) under the head of "Material—Vouchers." These vouchers, when entered on the register, should be debited to "Material—Vouchers." Vouchers originating with other officials of the company who have no occasion to render monthly distribution books, should be debited on the register to the proper operating, material or other account, whatever it may be.

Accounts against a company should receive immediate attention from all through whose hands they pass. Vouchers should be made promptly; should be entered on the day re-

* Form 81, Appendix D.

ceived and should be approved for payment without being held longer than necessary to verify their accuracy. Finally they should be paid on the day on which they reach the disbursing agent of a company, unless business reasons prevent. The greatest promptness should characterize the making, auditing and paying of vouchers; delay in such matters evinces lack of attention or proper business methods; it inconveniences and in many cases seriously embarrasses the parties in interest.

If for any reason those whose duty it is to certify to or approve vouchers should withhold their signatures, they should forthwith notify the official or agent of the company with whom the voucher originated, so that the embarrassments to the service likely to be occasioned by absence of such knowledge may be avoided.

Cases may sometimes arise of such urgency as to require payment in advance of the auditing of a voucher to cover the same. When this is done the money thus advanced should be charged to the official of the company who receives and disburses it, but no payment should be made in advance of auditing except under rules and regulations established beforehand by the general accounting officer.

In the event any portion of the money advanced under the foregoing rule is reconveyed into the treasury, it should be credited to the account charged. For such portion of it as may be disbursed, a voucher should be made by the official making the disbursement in favor of the person or persons to whom it is paid; the receipt of such person or persons should be attached to such voucher.

Vouchers made on account of money advanced should be credited to the person charged with the advance. On the face of all such vouchers the person making the same should note in red ink that it has been paid, giving the name of the person by whom paid, thus: "Paid by Charles Murray, Sup't." A similar notation should be made on the back of the voucher, underneath the filing. The notation should be plain and conspicuous, so as to prevent duplicate payment.

In entering on the "register of audited vouchers" a voucher that has already been paid, the fact of its having been paid should be noted on the register in every case, giving the name of the person by whom paid; this will enable the auditing officer to prevent duplicate payment in the event the fact that the voucher has already been paid should be overlooked by the treasurer.*

* The foregoing rules refer more particularly to disbursements of cash by officers of a company in settlement of claims and similar matters, and must not be confounded with the rules and regulations governing bills paid by station agents in advance of vouchers being made therefor, given further on.

PAYING VOUCHERS.—Vouchers are required to be approved by the proper officer before being paid.

In order to systematize the payment of local expenditures connected with the working of the property, including the paying of vouchers, pay rolls, claims and balances of every kind, such payments should be made directly from the office of the treasurer or under his direction.

Before paying a voucher or delivering a check, the payee should be called upon, whenever practicable, to state specifically the amount and nature of his claim. His ability to do so will serve in a measure to identify him and is, moreover, corroborative evidence of the correctness of the account. It will, in addition, enable a company, without the knowledge of the payee, to correct any mistake that may have been occurred in auditing whereby too much may have been allowed, either through duplication of the account or otherwise.

Vouchers payable at or near an agency are oftentimes sent to the agent to pay in currency. When the amount is large, or beyond the ability of the agent to pay out of the receipts for one day, it is better to send the money with the bill. If, however, an agent should be inadvertently asked to pay a voucher that the proceeds of his station do not render possible without waiting to accumulate cash (and thus discontinue his remittances), he should advise the treasurer of the facts in the case and await his instructions and not hold his collections.*

Vouchers sent agents to pay and not called for or paid within thirty days should be returned to the treasury, with a statement of the reason why not paid, except when checks or drafts are sent with vouchers, in which case they should be returned within ten days.

When more than one voucher is sent to an agent at one time, they should be paid as fast as the receipts of the station will permit and should be remitted from day to day, as fast as paid, without waiting for the whole lot to be disposed of.

Vouchers should be remitted by the first express after they are paid.

In the event vouchers are sent to the wrong agent to pay, they should be returned forthwith by express.

The signature to the receipt at the bottom of a voucher should be exactly the same in every particular as the name of the person or persons to whom the voucher is payable; unless this is the case, credit cannot be allowed the agent for paying the same.

Vouchers should be receipted by the person or persons to whom they are payable, or by someone known by the agent to

* One reason for this, and a good one, is that to hold his receipts would be to break the line of remittance, whereas I have always believed that the gross sum collected each day should be remitted daily.

be authorized to collect the amount and receipt therefor. In paying vouchers to persons holding orders, agents should see that vouchers are receipted by the person or persons to whom the order is payable, attaching the order to the voucher in every case. Agents are held strictly responsible for vouchers paid to unauthorized persons.

It will sometimes be necessary for the treasurer to pay money to an attorney or other agent of a company, to enable such attorney or agent to satisfy some claim decreed by the courts, or otherwise. In such cases the disbursing officer will take the receipt of the attorney or agent for the money thus paid. This, however, is merely preliminary. When the money is finally paid by the attorney or agent to the person or persons to whom it belongs, a receipt therefor should be taken. This receipt should be filed with the one already rendered to the disbursing officer by the attorney or agent. When a receipt from the person or persons to whom the money is finally paid cannot be secured, as sometimes occurs when money is paid to the officers of the courts, then all the facts connected with the payment should be recounted and placed on file in lieu of a receipt.

When the payee of a voucher cannot write, the agent or cashier of a company cannot act as a witness if the voucher is paid by him.

Duplicate receipts, if any are attached to a voucher, should be receipted, dated and returned with it.

Agents should not permit papers attached to vouchers to be detached. Such papers are necessary to the completeness of the voucher and should not, therefore, be disturbed. They are, moreover, as a rule, confidential in their nature, and should not be inspected or read by the payee of a voucher, except when attached for his information.

After paying a voucher, the agent should stamp it in a plain, legible manner (on the same date) with the station stamp, directly under the filing on the back of the voucher. This is evidence that it was paid by him.

In the event a voucher or check is lost, a company should require in every instance a good and sufficient bond of indemnity to be filed by the payee before issuing a duplicate.* Great care should therefore be taken to protect vouchers and checks.

No unaudited voucher or account should be paid except upon the authority of the treasurer, and not then except in extreme cases, to meet the emergencies of business.

Great trouble and risk are sometimes experienced in the payment of vouchers in consequence of their not being made in

* Form 77, Appendix D.

favor of the right person or persons. In some instances the initials of the payee are wrong; more often, however, the name is given incorrectly; in case of corporations and firms, names are transposed, or the vouchers are made in the name of individuals. When an error of this kind is discovered, payment should be stopped until the voucher can be corrected. Money should never be paid except to the person or persons named in the instrument.

When it is found that an error has been made in the amount or name of the payee of a voucher or check sent to an agent to pay, such voucher or check (or both) should be returned to the treasurer unpaid, with a statement of the facts in the case, so that the matter may be corrected.

Under no circumstances is it permissible for an agent to change or deface a voucher or check in any way.

If, for any reason, payment is not to be made to the person in whose name a voucher is made, the facts should be noted on the face of the bill, also on the back of the voucher underneath the filing, giving the reason therefor and the name of the person to whom the money is to be paid. This indorsement (except in the case of transfer orders attached) should be signed by the person or persons certifying the voucher and should be satisfactory in every respect to the treasurer, otherwise payment should be withheld awaiting satisfactory explanation.

In paying vouchers to persons holding orders, the order should be attached to the document in each instance, and the person holding it made to sign in lieu of the principal. But it should not be forgotten that a company is averse to accepting orders save for good and sufficient reasons. It prefers to treat directly with the principal.

GAS BILLS.—In order that a company may avail itself of the advantage arising from the custom of illuminating companies of discounting their bills on condition of prompt payment, the following expeditious method of providing for their settlement is suggested:

Bills that accrue at shops, stations and department headquarters should be certified to and forwarded immediately to the division superintendent for approval. He should enter them in his distribution book under the head of "Vouchers chargeable to storekeepers," and charge the proper operating expenses. He should then stamp and forward them without delay to the agent most conveniently located, for payment. After they are paid by the agent they should be stamped on the back with his station stamp on the date paid, and forthwith remitted to the treasurer as cash.

When no discount is allowed for immediate payment, such accounts should be treated the same as other bills. Officials in

charge should see that bills are paid promptly and that the company receives the benefit of the discount allowed.

The treasurer may (to avoid a multiplication of bills) bring together into one voucher all bills of the foregoing nature paid in any one month.

PAYMENT BY AGENTS OF BILLS DUE BY A COMPANY BEFORE THEY ARE AUDITED AND APPROVED.—No agent should be authorized to pay any bill, voucher, certificate of discharge, or other evidence of debt against a company, except under established rules, on accounts duly audited and approved.

In the event, however, it should become necessary in the course of business for an agent to pay money in advance of the approval of the document, it may be done upon the written direction of the treasurer, or, in an emergency, on the written order of a general approving officer of a company.

In such cases the agent should be directed to make the payment and take a receipt therefor, holding the latter, with the order directing the payment, until a voucher can be audited relieving him of the charge.

This voucher should be prepared without delay, in the department in which the claim originated, and should be made in the name of the person to whom the money is paid.

This voucher should pass through the same channel as other vouchers, and be treated, so far as the methods of approving and auditing are concerned, as if unpaid.

On the back of said voucher, however, under the proper filing, the maker should plainly note in red ink, "Paid by Blank, agent at Blank station," a similar notation being made on the face of the voucher.

When the money is paid in this way, the receipt taken by the agent should describe the purpose of the payment.

This receipt should be technically legal in form.

Afterward it should be stamped with the station stamp.

When the approved voucher reaches the agent, the receipt should be attached thereto by him; also the order.

The voucher should then be remitted without delay, as the rules prescribe.

Whenever a payment is directed to be made otherwise than by order of the treasurer, the latter should be forthwith notified of the fact; but no such order should be issued except in the absence of the treasurer, and to meet an exceptional and imperative necessity.

CANCELATION OF VOUCHERS.—Up to the time the books are closed, and the statement of audited bills entered upon the general books, any error in the amount of a voucher may be corrected, or the voucher itself may be canceled and withdrawn from the register of vouchers by simply canceling the entry on such register. Afterward, no correction is possible; if an error

has been made in the amount, the instrument should be formally canceled and a new voucher made.

When it is desired to cancel a voucher after the books are closed, it should be forwarded to the accounting officer, so that the cancelation may be made on the books in due form.

Vouchers requiring to be canceled after the books are closed should never be torn up or destroyed, as they are required for filing.

In the event it is necessary to cancel a voucher, the request therefor should be noted on the back, underneath the filing, with the reason given. This should be signed officially.

In case a new voucher is required, the person making the original bill should, if practicable, be called upon to make the same.

In canceling vouchers, the amount should be credited to the account originally charged.

When vouchers which have been charged to "material vouchers" are canceled, an entry should be made on the distribution book of the storekeeper who accounted for same, in the following manner: The amount of the vouchers canceled should be deducted from the total amount of "Vouchers chargeable to storekeepers" for the month, and the operating or other accounts first charged with the vouchers should be credited.

When it is desired to cancel or change a voucher before the books are closed, it should be referred back to the various officials upon whose books it appears, so that they may cancel or change the entry thereon.

Specific reference should be made in the distribution book to each voucher or various persons' bill canceled, and the reason for cancelation given. Notice should be given by the accounting officer monthly of all vouchers and bills to be canceled, and no cancelation entries should be made on the distribution books other than for the vouchers or bills reported by the accounting officer.

TAKING RECEIPTS.—HOW INDORSEMENT SHOULD BE MADE AND RECEIPTS SIGNED.—The taking of a receipt when paying money on account of a company is necessary to protect both the principal and the agent; the receipt should, moreover, be technically and legally correct.

In no case, therefore, should an agent of the company pay money on its behalf without taking a due and proper receipt therefor at the time. An endorsement on the back of a check, draft, time ticket, bill of exchange or similar instrument, is an acknowledgment and will answer the same purpose as a receipt.

Receipts and acknowledgments for money, property or other consideration, and all endorsements on the back of time tickets, letters of identification, orders, drafts, and checks, should correspond in every particular with the name of the payee. For

instance, if a document is made in favor of "James Carcliff," or the transaction is with him, a receipt or endorsement cannot be accepted signed by "James Carkliff."

If the name of the payee, as written, is spelled incorrectly the document cannot be paid, but should be returned and formally corrected.

Vouchers should only be paid to the individual, firm or corporation in whose name they are drawn.

They may be paid upon the presentation of an order properly drawn by the payee or by the legal and binding representative of such payee. The authority should in every case be securely attached to the voucher.

All time tickets, letters of advice, checks, drafts, bills of exchange and similar documents, should be personally endorsed by the payee or by a legal and binding representative of such payee. As it is neither convenient nor safe to attach orders in these cases they will not be accepted.

Documents in favor of corporations should be signed by the duly authorized agent or officer of such corporation, the name and title of the person being given in full in every instance.

Signatures should be witnessed in all cases by some responsible person when the payee is not personally known.

Endorsements by mark cannot be witnessed by an agent, cashier or other person for moneys paid by them.

When a payee cannot write he should make his mark in legal form in lieu of a signature.*

Those who make payments should be held strictly responsible for the *bona fide* character of the receipt or acknowledgment and the payment of the money to the proper person or persons.

Drafts or checks cashed by agents or accepted by them should be indorsed according to the rules and regulations made especially for such cases.

Checks and drafts received by agents in the regular course of business, which are to be remitted, should be indorsed payable to the order of the bank to which they remit, in form, as follows:

"Pay to the order of
..... Bank .....
..... Railway Co.
By ..... Agent, Rochester."

* This mark should be witnessed by some responsible person personally knowing the payee; in form as follows:

His
RICHARD X ROE.
Mark.
Witness: JOHN SMITH, Chicago, Ill.

This indorsement should be made immediately upon receipt of the document, so that, in the event it is lost, it cannot be misused.

Checks and drafts should be drawn to the order of the collecting agent (as an agent), and before being remitted should be stamped as directed and formally indorsed by him.

In the event an agent should, in the regular course of business, accept checks or drafts not drawn to his order as agent, or made payable to his order, they should nevertheless be indorsed by him, as above, so that his responsibility may always appear, and the misuse of checks prevented.

Indorsements made on time tickets, checks, drafts or other paper remitted by agents, should give the name of the station at which the agent is located.

Indorsements should, if possible, be made by the agent, and not by his clerk; exception will be made to this rule when the cash is practically or formally in charge of a cashier.

Indorsements should be technically and legally perfect.

All time tickets, vouchers, gas bills, freight bills and similar documents remitted by agents should be stamped by them with the station stamp on the date they are paid.

The foregoing rules and regulations apply more particularly to receipts to vouchers and indorsements on checks, drafts, notes, time tickets and kindred documents. They are equally applicable, however, to receipts of consignees for freight and for advances made by a company, and for transactions of every kind wherein the public is concerned; also to receipts given by agents and others for charges on freight and collections of every description.

Signatures should never be inserted with a stamp. Some distinguishing mark or name should be written with pen and ink.

It should be remembered that the signing by one person for another is not binding unless duly authorized, and whenever a person signs for another, the name of the person signing should be given. If a person having power of attorney signs, he should attach to his signature "Attorney in fact;" if he signs as trustee, administrator, agent or otherwise, the fact should be duly stated beneath his signature. It is the duty of the agent or official who accepts such signature to satisfy himself at the time that the person signing is duly qualified.

It should be kept constantly in mind by all who pay money that while it is easy for them to assure themselves of the creditability of those to whom they pay before the transaction occurs, it is often difficult or impossible afterward. Men are

ever willing to substantiate their right to receive money, if required to do so before the transaction. Afterward they are indifferent in many cases, and the burden of proof rests with the payor instead of the payee.

METHOD OF ACCOUNTING FOR INTEREST ON BONDS—HOW COUPONS SHOULD BE TREATED WHEN PAID; HOW FILED—METHOD OF ACCOUNTING FOR INTEREST ON REGISTERED BONDS.

The method of accounting for interest payment on registered bonds is very simple compared with the methods devised for recording the payment of interest on coupon bonds.

In the former case the financial officer makes a certified statement of his disbursements for this purpose, and the accounting officer, after satisfying himself as to the authenticity of the same, allows the necessary credit.*

While there are numerous methods of accounting for coupons redeemed, the following may safely be observed:

When a coupon is paid, the officer paying it should cancel it by punching it at least twice; this will prevent the possibility of its reappearance upon the street.

As a rule coupons reach a company through the various local banks and collecting agencies. All the coupons presented by each party or agent should, after cancelation, be enclosed in a separate envelope, and upon the face of this envelope should be written the name of the payee, the date of payment, the names of the mortgages from which the coupons have been detached, the number of coupons presented for each mortgage, the gross amount of such coupons, and, finally the total amount paid. A history of each transaction will thus be preserved temporarily in its entirety for reference. This information, as may readily be supposed, will be invaluable afterward in adjusting accounts verifying payments and satisfying inquiries.

After payment is made all the envelopes containing coupons, together with a detailed statement of the same, should be turned over to the accounting officer for examination and record. Upon their receipt the latter officer should proceed to verify the contents of the different packages and satisfy himself of the correctness of the accompanying statement in which the aggregate payment is given. The foregoing facts being determined, he should file away the various coupons re-

* In many cases he has countersigned the checks with which the interest was paid.

ceived. A good plan for this is as follows: a record book is provided for the coupons of each class of bonds; the filing upon the back of the book specifies the name of the mortgage; the first page corresponds to bond number one, and so on through the book. The amount of the bond is specified at the head of the page. Each page is divided into as many squares, or blanks, as there are coupons attached to the bond; the blanks also correspond in size to the coupons. Each blank space on the page is numbered, and if the bond has fifty years to run, and the interest upon it is payable semi-annually, there are one hundred blanks provided—two for each year. The coupon maturing first is pasted in blank number one, the second in blank number two and so on. The blanks in the book that are unoccupied represent at a glance the coupons that are outstanding. The aggregate of the outstanding coupons is the amount of the company's liability for unpaid interest on its past due coupons. It is thus not only easy to ascertain precisely the aggregate liability, but it can also be determined readily for the different classes of coupons.

The plan is simple, economical and effective. The financial officer delivers up the canceled coupons before receiving credit for their payment. After his accounts are verified the canceled coupons are pasted in the book by the accounting officer, in the manner described, and in such form and with such system that reference can be made in an instant to any particular coupon that has been paid.

Under this method of accounting any attempt to foist a spurious coupon upon a company could not possibly remain undetected, no matter how perfect the counterfeit might be, for the reason that when the time came for filing it away the person performing this duty would find the place allotted to that particular coupon already filled; or, if the spurious coupon were paid before the genuine, then it would occupy the place of the latter in the file. In either case the counterfeit would be quickly detected.

The foregoing method of accounting for paid coupons affords, in the multitude of checks it enforces and suggests, the maximum amount of security attainable at the least possible cost.

There should be no connection between the person who pays the coupon and the person who audits the account of the payor and pastes the coupon in the record. The person who draws off the balance sheet of outstanding (overdue) coupons and balances it with the company's books so incidentally verifies the accuracy of the statement that every coupon claimed to have been paid has actually been paid.

SINKING FUNDS—ACCOUNTS TO BE OPENED ON THE BOOKS THEREFOR.

In the first place, specific accounts should be opened on the general books of a company with each particular sinking fund, and to such accounts should be charged or credited, as circumstances require, each particular installment.

In order that the exhibits of a company may show a full and clear record of the sinking funds, the following rules are suggested:

When sinking fund installments are charged against revenue they should be embraced in income account in the month in which they accrue without reference to when they are paid, and such amounts should be carried on the credit side of the balance sheet under the head of "Accruing sinking fund installments." This item will of course disappear when the installments are paid.

The amounts so paid should be shown on the balance sheet as an asset under the head of "Amount deposited with trustee of sinking fund"; and on the opposite side of the balance sheet an account should be opened with "Sinking fund installments paid"; the former account representing the amount of cash or bonds, as the case may be, in the hands of the trustee, and the latter the amount of income used for paying such sinking fund installments.

When sinking fund installments are not charged against revenue, the aggregate amount of the sinking fund will appear on the credit side of the balance sheet under the head of "Past due sinking fund installments"; on the opposite side of the balance sheet an account should be opened to be known as "Unpaid sinking fund installments." Both of these items will disappear with the payment of the sinking fund, and the amount so paid will appear upon the debit side of the balance sheet as an asset under the head of "Amount deposited with trustee of sinking fund."

When bonds that are paid into a sinking fund, or bonds of a company owning the sinking fund which are purchased with cash payments to said fund, remain uncanceled, such bonds should appear upon the credit side of the books and in the accounts as "Live bonds in the hands of trustee of sinking fund"; these latter should of course be withdrawn on the books and in the exhibits from bonds outstanding.

When bonds paid into the sinking fund, or bonds of a company owning the sinking fund which were purchased by the trustee with cash payments to such fund, are canceled, the outstanding bonds should be reduced upon the books and in the accounts by a corresponding amount, and no canceled bond, whether in the sinking fund or elsewhere, should be

embraced as an asset or liability upon the books or in the accounts.

When it is desired to re-capitalize bonds that have been purchased for the sinking fund and canceled, the process, so far as the accounts are concerned, should be the same as when the securities were first issued, viz.: the amount of the bonds or stocks issued should be credited as outstanding, cash being charged with the proceeds of same.

When bonds paid to satisfy sinking fund requirements, or bonds purchased with cash payments to said sinking fund, remain uncanceled and continue to draw interest, the trustee should be charged with all such interest received under the head of "Trustee of sinking fund account accretions from investment of installments"; and on the opposite side of the balance sheet an account should be opened, to be known as "Accretions from investment of sinking fund installments."

When sinking funds are paid in cash or uncanceled bonds, the amount of such cash or bonds appears, as described above, as a debit until the obligation for which the sinking fund is credited is finally retired. When this event transpires, the accounts "Amount deposited with trustee of sinking fund" and "Trustee of sinking fund account accretions from investment of installments" should be credited; and "Live bonds in hands of trustee of sinking fund" charged with that portion of the sinking fund represented by bonds of the issue for the benefit of which the sinking fund was created which the trustee cancels and returns the company. The balance of the sinking fund, if any, represented by bonds of other classes or cash, or both, as the case may be, being returned to the company by the trustee, should be added to its assets, the amount being credited in the same manner as stated above for canceled bonds returned by the trustee, i. e., to the accounts, "Amount deposited with trustee of sinking fund" and "Trustee of sinking fund account accretions from investment of installments."

In the event the payments made to the sinking fund were charged to income, the amount of same, together with all accretions from their investment, should be transferred back to income account from "Sinking fund installments paid" and "Accretions from investment of sinking fund installments," respectively. These entries close the different accounts.

By accounting for sinking funds as described, the exhibits of a company will always show at a glance the amount of all funds in the hands of the trustee belonging to the sinking fund; how much of same represents respectively payments made to the fund and accretions to it from investment of such payments; and also what amount of payments, if any, were charged against income.

CHAPTER XXVIII.

GENERAL REGULATIONS.

Storekeepers should, at all times and in all places, exercise a watchful and intelligent care over the interests of the company employing them. Any irregularities of an improper character which they may discover, and which they cannot rectify, they should forthwith report to their superior officer.*

In accounting for items of expense not specifically provided for, the practices followed in analogous cases should govern. In the event of doubt, the matter should be referred to the proper officer.

In writing up the account of disbursements a company is, in the main, dependent upon the information which it gathers from the books and statements received from those who write the material and labor accounts; it is, therefore, of the utmost importance that storekeepers should at all times be painstaking and vigilant in the discharge of their duties.

It is their duty to keep themselves fully advised, by careful observation and intelligent inquiry, in reference to the nature, character and scope of each and every account to which material and labor are charged.

Storekeepers should see that storerooms are kept clean and orderly, that the supplies under their charge are compactly and systematically arranged, so that they can be got at conveniently and the amount on hand easily ascertained, that the cost price of each article or lot of material is properly recorded, and that the material in the yard and outhouses is arranged so that it can be protected and watched over to the best advantage.

All returns, statements and pay rolls required of storekeepers by the officers of a company should be carefully and promptly made, and should be sent forward without delay.

The names of officials of a company should not be signed by their clerks to certifications, receipts or orders, unless duly authorized, notice of which should be filed wherever such sig-

* In order that responsibility may be enforced, and that there may be due subordination and harmony of action, it is desirable that the forces occupied in connection with the material and labor accounts at shops and storehouses and depots of supply should be immediately subordinate to the storekeeper.

natures are to be accepted as authentic. The name of the clerk should be signed in full; thus, if a division superintendent's clerk signs for him, the signature of such clerk should be given in full underneath the name of the superintendent. This rule applies to vouchers, various persons' bills, pay rolls, time tickets, letters of advice, requisitions, invoices and kindred documents, and should be rigidly observed in order to avoid delay and embarrassment.

In order to expedite work, books should be, so far as practicable, opened before they are needed, i. e., before the accounts for the preceding month are closed. This will expedite the work and lessen the labor of the office at the time when it is particularly pressing. Thus, the bulk of the headings likely to appear in the distribution books for labor and material may be inserted in advance.

The papers and records of a company should be kept written up and carefully filed from day to day, so that in the event of accident or sickness to employes, the work can be clearly and intelligently taken up and carried forward by new men.

An impression should in each and every case be taken in the copy books of all letters, telegrams, pay rolls, statements, distribution books, etc.

When a stub or record is attached to any document, it should be written up at the time in every instance, as contemplated, so that an account of the document may be on file in the office where it is issued, for use or reference when required.

No bill or account should be accepted as correct until it has been examined. This examination should be particular, including rates, extensions and footings. In the event of error, correction should be made and the maker of the document notified.

The books, papers and records of a company are required to be kept so long as they may be useful or are needed to protect the interests of a company, or to elucidate the affairs of those who manage its interests. When no longer needed they should be forwarded to the general storehouse. The material thus received should be brought upon the books the same as other old material at its value; a full description of the same, including the name and address of the person from whom received, should be given in every case. Its value should be credited to the account originally charged.

Storekeepers should not absent themselves from their business without the permission of their superior officer. Their duties require their presence continually at their storehouses, and they should not absent themselves therefrom without provision being made for the performance of their duties.

Any request from public authorities or otherwise, for in-

formation in regard to matters connected with material, labor or other affairs of a company, should be referred to the head of the department in interest for instructions.

In view of the fact that it is impossible to wholly separate expenditures from matters of a general nature, storekeepers and others interested will find it necessary to study the rules and regulations governing other departments of the service.

In reference to the disbursements and expenses of a company along its line and at shops and storehouses, the traveling auditor should see that the rules of a company governing the handling of material, keeping the time of employes, and accounting for disbursements are faithfully and fully observed. To enable him to do this intelligently, it is necessary that he should familiarize himself with the duties of storekeepers and timekeepers.

He should make an examination of the affairs at each shop or storehouse as often as once every three months, and report of such examination should be forwarded to headquarters.*

His duties may be generally defined as follows:

First.—Examining into the methods of keeping the time of employes and making the pay rolls.

Second.—Examining into the methods of making bills and vouchers.

Third.—Examining into the methods of distributing labor, material and miscellaneous disbursements to the proper accounts.

He must see that the method of recording the time of employes and computing wages is such as to secure accuracy.

In the case of employes at shops, he must see that they are properly checked in at the commencement of work, morning, afternoon and evening. Also see that the checks are collected from the day forces during the last two hours worked, morning and afternoon; and in the case of night forces, at the time the employes leave work. He must see that every employe at the shops makes a daily distribution slip showing upon what he worked and that such reports are certified to by the foreman immediately in charge. These reports must be made at the close of each day's work and examined by the foreman without delay. He must see that the reports of over-time worked by employes are properly made and in every case certified to by the foreman immediately in charge and are approved by his superior officer before the time is entered on the time book.

He must also see that all over-time and regular time worked by employes is promptly entered in the time book and properly distributed to the accounts for which the work was

* See Form 84, Appendix D.

performed. At the close of the month the time book must be footed and extended (at rates authorized) by the timekeeper before writing the pay roll, and the footings and extensions of the time book must in every instance be verified by a person other than the timekeeper.

In the case of Track, Bridge and Building, Engineering, Station forces, etc., he must see that all time worked by employes is entered daily by the foreman immediately in charge, in the time books provided for that purpose. He must see that the time books are footed and the wages extended (at rates authorized) and that the book is certified to by the foreman in charge before it is transmitted to his superior officer. He must see that all footings and extensions in the time books are verified in the office where the pay roll is made before the time is entered on the pay roll; this should be done by some person other than the one footing and extending the time-book in the first place.

He must see that no time is allowed trainmen and enginemen except upon trip reports or time slips properly certified to by the conductor or engineer; also that the trip reports are checked back by the timekeeper with the train dispatcher's report of train movements and all discrepancies investigated and errors corrected, before the time is entered in the time book. He must see that a proper notation or check mark is put on the time slips and train dispatcher's report in order to indicate that same have been compared and checked; this will automatically prevent the passing of duplicate claims. He must see that every claim for delayed time and over-time is approved by the division superintendent in the case of trainmen's time, and by the superintendent and master mechanic in the case of enginemen's time, before it is allowed. He must see that the time slips of enginemen in yard switching service are checked with the report of time worked by switch yard crews, rendered by the yard master, before the time is allowed. At the close of the month the time books should be footed and extended (at rates authorized) by the timekeeper; but before writing the pay roll, the footings and extensions of the time book must in every instance be verified by some person other than the timekeeper.

He must see that the pay roll is written directly from the time books and afterwards checked back (with the time books) by some person other than the one writing it in the first instance; the pay roll should be carefully footed and the footings checked twice by persons other than the one footing it at first. In every case before writing the pay roll the rates of compensation allowed employes must be compared with the last preceding pay roll and no increases made without written authority from the proper official. He must also see

that the rules governing the certification of pay rolls are fully complied with in every case. He must also see that the rules of the company regarding the bonding of clerks who are responsible for the making of pay rolls, time-tickets, and the delivery of pay-checks to employes, are fully complied with. He should submit a statement to the accounting officer at the time of each investigation, giving the names of all employes at the point specified who should be bonded.

In examining into practices observed in making bills and vouchers, he must see that the charges are such as may be prescribed and, generally, as much as those made by other companies in similar cases; also that all items of expense are included in making bills. He must see that charges made by other companies are reasonable and not more than those made by his company for similar items.

The practices of different offices should be compared so that uniform methods and the best methods may prevail so far as possible. He must ascertain if bills are made as required in every case where facilities are being used by other companies; also in all cases where bills should be made, so far as the same are ascertainable.

In examining into the methods of distributing labor, material and miscellaneous disbursements to the proper accounts, he must see that the practices are in accord with the rules and regulations of the company; that the labor distribution book is balanced with the total of the pay roll, or, if there is a difference, that the postings are checked back and the error located and corrected. He must see that the price lists are kept in every office where material disbursements are accounted for and that prices are corrected promptly upon receipt of invoices; that material is charged to the proper accounts in the month in which it is used; that scrap is credited to the proper accounts in the month in which it is received; that no usable material is put in stock without crediting the proper account with the value thereof; and finally, he must see that all the rules and regulations of the Accounting Department are complied with in spirit and letter.

Such are the specific rules and regulations governing the Traveling Auditor. They should be supplemented by him by such further inspection and audit of pay roll and material accounts and accessories as the circumstances of the case and the interests of the company require. Moreover they will be interpreted in their general sense when changes or different systems are not in conformity therewith.

CHAPTER XXIX.

RAILWAY CONSTRUCTION AND CLASSIFICATION.

Construction properly embraces the original or first cost of a property; all disbursements, expenses, costs, commissions, salaries and debts incurred in connection therewith or incident thereto; the accruing interest on the amount invested while the property is in course of construction and before it is opened for business; all disbursements and losses suffered in the sale or disposal of bonds, shares, securities, or assets, the proceeds of which are used in its purchase or development; all expenditures on account of its rights, franchises and appurtenances. These constitute the first cost of a property.*

In the event of the abandonment of any portion of a property, the amount derived from its disposition or sale is a credit to construction.

After a property is opened for business, nothing can properly be charged to construction except additions or betterments. No structure, work or addition should be embraced under the head of construction, except to the extent that it adds to the original, the said structure or work being in the nature of an accession, and not intended to replace something of a similar nature, worn out or destroyed at the same place or in the immediate vicinity; thus, if it is intended to erect a building where no building before existed, all labor, material and money expended thereon is properly chargeable to construction, and so on for new platforms, stockyards, fences, grounds and other outlays. Additions, enlargements, improvements and necessary changes, also all improvements, additions, extensions or accretions that add to the first cost of a property constitute construction. These embrace the imple-

* There can be no difference of opinion as to what constitutes railway construction; as to what is properly chargeable to construction and what is properly chargeable to operating expenses. The practices of railways, however, differ in such matters, and for good cause. Items that one railway will charge to construction and capitalize, another road will charge to operating expenses and pay for out of income. The reasons for these practices are founded upon the necessities of the case and good business judgment. The rules that animate railway managers in such matters are too complex to be discussed here; I have referred to them at considerable length in the volume of the "Science of Railways" series on financing, constructing and maintaining.

ments and utensils used as well as realty and other property. If, for instance, it should be found necessary to increase the capacity of a coal house by making the building longer, wider or higher, the building would be just so much more valuable, and the cost of enlarging the same would be a proper charge against construction. The same principle holds good in reference to new tools and machinery, new side tracks built, additional yard grounds acquired, new buildings, platforms and fences erected, and so on.

The cost of remedying any defects in consequence of a property not having been constructed in a first-class manner in the first place, is a proper charge against construction.

In charging construction with the cost of additions, enlargements or betterments, it should be kept in mind that only that which adds something to what before existed is thus chargeable. It may cost more to repair or renew a structure than the original cost, nevertheless, the whole cost thereof should be charged to operating expenses, unless the structure has been improved or enlarged in the process. If in renewing a pile bridge or culvert, the structure is lengthened, the added length is a legitimate charge to construction, although the structure may not be of a more permanent character than the one originally constructed. But in determining what amount shall be charged to construction in such a case, the cost of the thing replaced should be first deducted; thus, if the added length of a bridge is charged to construction, the cost of the roadbed it replaces should be deducted from the charge to construction.

The principle which should be observed in all cases is not to charge to construction more than the added cost that may be incurred in the betterment of a property, or the adjustment of the same to the varying necessities of business, or the correction or remedying of structural changes caused by the vicissitudes of weather or climate.

The cost of removing an old structure, preparatory to the erection of a new one, is a proper charge against construction in the event the removal is precipitated by the necessity of enlarging or improving the structure. If the removal is because of its being worn out, or is in the nature of necessary repairs and renewals, the expense of removal should be charged to operating expenses, even though an enlarged or improved structure is erected in its place.

The value of the improvements to a property, if in the process of improving no additional expense is incurred, should generally be charged to operating expenses. Thus, if in the manipulation of a property a superior article of metal is used

and it does not cost more than that which it replaces, it is not customary to charge anything to construction.*

What a company earns while its property is in course of construction, and before it is formally opened for business, should be credited to construction, if the cost of conducting the traffic has been charged to construction. It is not proper if the expense has not thus been charged.

After a property has been opened for business, the cost of working the same and the wear and tear attending its operation (including all repairs and renewals) are chargeable to operating expenses. But so long as a property is not formally opened for business, or is only used in the handling of construction material, all the expenditures attending its operation are chargeable as a part of the cost.

The following classification of construction accounts describes the various sources of expenditure that enter into the construction of a railway, and the additions, enlargements and betterments that attend its operation after being opened for business. It is the classification prescribed by the Interstate Commerce Commission of the United States, and is therefore official.

Great care is required to be exercised in the classification of construction accounts to see that charges are entered under their proper headings. The classification given herein describes the general accounts into which the items that make up the construction account are merged. For the uses of railroads, however, it is required that an account should be opened with each second track, building, platform, bridge, fence, siding, or other piece of construction work. At headquarters, charges to these sub-accounts are merged into the general construction accounts in which they belong. The location and identity of work should be accurately described in every instance by the local accountant, and the details of each charge given in order that such charges may be properly distributed to the general construction accounts.

The general construction accounts of railroads are as follows:

CLASSIFICATION OF CONSTRUCTION EXPENSES.

1. ENGINEERING.—To this account should be charged all salaries and expenses of engineers, assistants, and axmen; teams for transportation of engineers and men to and from work, or upon trips of inspection of line of work, or incidental

* This rule, while generally observed, will be understood to be nominal only. A company has the same right to the value of its improvements, and to derive advantage therefrom in increased income, that an individual has whose property is heightened in value and earning power by the improvements he make.

thereto; engineers' instruments, rods, chains, axes, hatchets, tape lines, keel or marking chalk, stakes, profile and drawing paper, tracing linen or paper, cross-section paper, transit and level books, cross-section or topographical books, India ink and colors, drawing boards, stools, map cases, paper racks, stationery for office or field, fuel, lights, and camp equipage, and other analogous items.

Proportion of engineers' expenses when engaged on special work should be charged to same.

2. RIGHT OF WAY AND STATION GROUNDS.—To this account should be charged the cost of land acquired for roadbed (of necessary width conformably to depth and slopes of excavations and embankments), station and terminal grounds; also the cost of land purchased for ingress or egress to or from station grounds; salaries and expenses of counsel, right-of-way agent, and of engineers and assistants when especially engaged upon such matters; stakes used to denote right-of way limits; expenses of appraisals, or of juries, commissioners or arbitrators in condemnation cases; cost of removal of buildings when upon right-of-way, station or terminal grounds, but not included in property purchased; stationery supplied right-of-way agent, engineers, and assistants, engineers' instruments, etc., when used for such purposes; commissions paid outside parties for purchase of properties for these purposes; cost of plats, abstracts, notarial fees, recording deeds, etc.

Note particularly account No. 3, "Real Estate," as regards the cost of property purchased but not required for the operation of the road.

3. REAL ESTATE.—To this account should be charged the cost of all land purchased by the railway company in excess of that actually required for roadbed, station or terminal grounds, or other specific purpose, including all expenses incurred in connection with such purpose as enumerated in account No. 2, "Right of Way and Station Grounds." A portion of the cost of land purchased outside right of way for borrow pits or waste banks should be charged to this account.

NOTE.—The amount to be charged to real estate should be an estimate of the salable value of said borrow pits or waste banks after completion of the road.

4. GRADING.—To this account should be charged the cost of grading roadbed, whether excavations or embankments; clearing and grubbing; dressing slopes of cuts and fills; reconstructing pikes or roads; ditching roadbed; berm ditches; cost of material taken from borrow pits, haul if allowed; amounts paid for privilege of making waste banks outside of company's right of way or station grounds; ditches for water ways not specially required by right-of-way agreement, in

which case cost would be properly chargeable to account No. 2, "Right of Way and Station Grounds." This account includes retaining walls and other masonry or riprap for the protection of embankments, cuts, and slopes; cribbing or bulkheading built to protect the tracks or embankments along the seashore or banks of lakes and streams, including the cost of any cribs, breakwaters, wing dams, or other devices constructed to change the direction of the current of a stream to prevent the washing of the bank; also freight on material, and transportation and subsistence of grading gangs.

5. TUNNELS.—To this account should be charged the cost of tunneling, including such timber as may be used for centering, packing, etc., cost of stone, brick, cement, sand, lime, salt, piles, timber, spikes, nails, braces, concrete, etc., used in the construction or lining of the same; cost of labor preparing or securing the same, transportation, scaffolding, cofferdams, and pneumatic caissons; cost of soundings, and machinery, pumps, engines, etc., used for such work. This account does not include grading or surfacing the roadbed, or cost of the track through the tunnel.

6. BRIDGES, TRESTLES, AND CULVERTS.—To this account should be charged the cost of all bridges and trestles erected to carry tracks over streams, ravines, streets, or other railways, and culverts, both substructure and superstructure, including transportation. This account should include abutments, piers, supports, draw and pier protection; machinery to operate drawbridges; masonry ends and wing walls for culverts; cost of inspection of bridge material either at shop or site of structure; cost of tests; cost of wing dams, cribs, or ice-beakers for the purpose of regulating the current of a stream or breaking up ice jams before reaching a bridge; also labor and material used in painting structure.

In case "false work" is furnished by the railway company for erection of bridge superstructure, the cost of same should be charged to this account, and when removed, the value of the material removed should be credited to this account and charged to the account benefited.

7. TIES.—To this account should be charged the cost of all cross, switch, bridge, and other ties laid in the main track or tracks, sidings, spurs, gravel, and repair tracks; in tunnels, depots, shop, and other yards, shops, and other buildings, etc.; on turntables, wharves, piers, track scales, inclines, bridges, trestles, and culverts; to and from coal chutes, coal pockets, fuel and water stations, etc.; also the cost of transportation, inspection, loading, unloading, and any process of preservation.

8. RAILS.—To this account should be charged the cost of rails laid in the main track or tracks, sidings, spurs, gravel,

and repair tracks; in tunnels, depots, shop, and other yards, shops, and other buildings, etc.; on turntables, wharves, piers, track scales, inclines, bridges, trestles, and culverts; to and from coal chutes, coal pockets, fuel and water stations, etc.; also the cost of transportation, inspection, loading, and unloading.*

9. TRACK FASTENINGS.—To this account should be charged the cost of spikes used for laying rails, and of fish and tie plates, splice or angle bars, chairs, rail braces, bolts, nuts, nut locks or washers used in connection with same; also the cost of transportation, inspection, loading, and unloading.

10. FROGS AND SWITCHES.—To this account should be charged the cost of all frogs, switches, and switch material, including switch stands (throw or lever), frog guard rails, crossing frogs, and timber, bolts, etc., used in foundations or base for same, and cost of transportation.

11. BALLAST.—To this account should be charged the cost of all ballast, whether of broken stone, slag, gravel, or other material especially provided for this purpose; also the expense of loading, hauling, unloading alongside of track, and transportation.

12. TRACK LAYING AND SURFACING.—To this account should be charged the cost of distributing, laying, spacing, and lining ties; cost of laying, spiking, and jointing rails, surfacing and lining track, including the adjustment of rail to proper elevation, and labor of placing frogs and switches; cost of track tools, including shovels, picks, track jacks, crowbars, levers, spiking mauls, gauges, and wrenches; cost of putting in ballast; service of engines, cars, and crews distributing track material, and transportation.

13. FENCING RIGHT OF WAY.—To this account should be charged the cost of all material and labor used in constructing board, wire, rail, hedge, stone, or other fences along the right of way or limits of roadbed, and transportation; but no charge should be made to this account for fences constructed around stock yards, fuel stations, station grounds, shops, and on other properties outside of right of way, which should be charged to their appropriate accounts. The cost of permanent or portable fences for protection of tracks from snow should not be charged to this account, but to account No. 28, "Miscellaneous Structures."

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* This account also represents the difference in cost between metals of different degrees of quality or weight, according to the general rules governing construction. Thus, if a heavier quality of metal is inserted in the track in place of lighter metal at an added cost, or if metal of a higher quality is inserted at an added cost, construction may properly be chargeable with the difference. Reversely, if lighter or poorer metal is inserted in the track, construction should be credited with the difference in cost.

14 CROSSINGS, CATTLE GUARDS, AND SIGNS.—To this account should be charged the cost of all labor and material used in constructing farm, country-road, or street crossings at grade, overhead bridges, cattle guards, and wing fences to same, and all track signs, crossing gates, and watchhouses at crossings, and transportation.

15. INTERLOCKING OR SIGNAL APPARATUS.—To this account should be charged the cost of interlocking or signal apparatus complete, when built by contract. If built by the railway company, the cost of labor and material, including all levers, racks, wires, pulleys, semaphores, semaphore signals, ground signals, posts, materials in box troughs, and other fixtures, tower, foundation for same, and all other work necessary to complete it, and transportation.

16. TELEGRAPH LINES.—To this account should be charged the cost of newly constructed telegraph and telephone lines, including poles, wires, billets, insulators, instruments, and all other materials used, also labor employed in the construction work, cost of all tools used, and transportation.

17. STATION BUILDINGS AND FIXTURES.—To this account should be charged the cost of all material and labor expended on all station buildings, including cost of transportation, platforms, sidewalks, excavation, foundation, drainage, water, gas, and sewer pipes and connections, steam heating apparatus, stoves, electric-light and power fixtures, including wiring for same, grading and putting ground in order after building has been finished; electric bells, elevators, and all other material, furniture, or fixtures used to complete the building; wells for water supply of stations; also salaries and expenses of engineers and architects.

NOTE.—This account should include the cost of similar buildings on docks, wharves, and piers, when used for station purposes.

18. SHOPS, ROUNDHOUSES, AND TURNTABLES.—To this account should be charged the cost of all buildings to be used as shops (including transfer tables), or roundhouses, (including cinder and drop pits), and turntables; plants for heating the buildings; platforms, sidewalks, and outhouses in connection therewith; oil houses, sand houses, storehouses for company's material, scrap bins, etc. This account should include amounts paid when erected by contract; labor and material when built by company, preparing grounds before and clearing up same after construction, foundations, painting, excavation for and lining of turntable pit, and of cinder or drop pits inside or outside of roundhouses; foundation for turntable, loading, unloading, and placing turntable in position, levers and stops for handling turntable; sewerage system, connection with water supply system, shop wells; architects' fees for drawing

plans, supervision of construction by engineering department or others; transportation and all incidental expenses. This account does not include the cost of tracks laid in connection with these buildings.

19. SHOP MACHINERY AND TOOLS.—To this account should be charged the cost of all new machinery and additional tools placed in any of the shops or roundhouses, including foundation for same; transportation, loading, unloading, and placing machinery in position. It must not include any machinery or tools purchased to take the place of those that have been worn out or destroyed.

20. WATER STATIONS.—To this account should be charged the cost of material and labor expended in the construction of water stations for the purpose of supplying locomotives with water, including cost of windmills, pumps, boilers, pumphouses, tanks, tubs, tank foundations, track tanks, or troughs, engines and all fixtures and pipes, standpipes or penstocks and connections; wells, dams, and reservoirs or cisterns; transportation; also engineering expenses, and tools used in the work. This account must not include waterworks, wells, etc., exclusively for supply of stations, hotels, tenements, or section houses, which should be charged to the appropriate accounts.

21. FUEL STATIONS.—To this account should be charged amounts paid under contract for, or the cost of all labor and material expended in, the construction of coal platforms, coal sheds, coal pocket chutes, woodsheds, and racks, and all machinery or appliances necessary to equip them for service. This account includes inclines at fuel stations (except the cost of track laid thereon), tipple cars, buckets, cranes for handling same, elevating machinery, gasoline or other engines for operating same, dumping machinery, all appliances for weighing coal in pockets and opening coal pockets, transportation, architects' fees, engineering, etc.

22. GRAIN ELEVATORS.—To this account should be charged the cost of ground on which elevator is located, cost of foundations, elevator building, conveyors, fixtures, and machinery complete; and all material, labor, transportation, and other charges incidental to construction. This account does not include the cost of small storage elevators at way stations, which are considered to be station buildings.

23. STORAGE WAREHOUSES.—To this account should be charged the cost of ground on which storage warehouses are located, and cost of buildings, machinery, etc., complete, when built by contract; if built by the railway company, the cost of ground, material, machinery, fixtures, and labor, transportation, and all other expenditures incident to construction.

The buildings herein referred to are not the ordinary

freight warehouses or stations where freight is received for shipment, etc., but warehouses in which merchandise is stored, and which the railway company or others operate as warehouses.

24. DOCKS AND WHARVES.—To this account should be charged the entire cost of docks, wharves, ferry or other landings, and inclines to transfer steamers, including grounds and riparian rights, dredging of slips, piling, filling cribs, pile protection, building cofferdams, pumping or bailing water, masonry walls or filling, etc., transportation, and all expenses incurred in the construction of these structures, except the cost of tracks and buildings thereon.

25. ELECTRIC-LIGHT PLANTS.—To this account should be charged the cost of all labor and materials, including cost of transportation, used to put in operation either arc or incandescent light plants, such as dynamos, engines for running dynamos, wire constituting lines, glass globes, carbon or arc lights, carbonized filament for incandescent lights, poles, hangers for lights, insulators, and every expense incidental to the erection of the plant. When it is necessary to erect a building for an electric-light plant, the entire cost of the same, including ground, should be charged to this account.

26. ELECTRIC-MOTIVE-POWER PLANTS.—To this account should be charged the cost of ground on which electric-power stations are located, and the cost of erection of power houses and car sheds, including all expenditures for labor and material, stationary engines, boilers, and machinery, pumps, condensers, foundations, and settings for steam plants; generators, foundations, and settings, switchboard, and lighting apparatus for electric plants; current conductors, including poles, wires, and labor for overhead work, third rails, fastenings for same and labor laying same, with cost of inspecting, loading, and unloading; feed wires, track-bonding, and grade-crossing cutouts; and all other expenditures connected with the installation of plants intended to generate and distribute electricity for motive power, including transportation.

27. GAS-MAKING PLANTS.—To this account should be charged the cost of all labor and material, including cost of transportation, used to put into operation a gas-making plant complete. The cost of ground on which the plant is located should also be charged to this account.

28. MISCELLANEOUS STRUCTURES.—To this account should be charged the cost of structures of every character, including cost of material, labor, transportation, and all incidental expenses connected therewith, which are permanent or a betterment to the property and enter into the cost of road, and which are not otherwise herein particularly referred to, and for which no account has been provided; the object being

to designate one general classification, to which may be charged the cost of all minor superstructures, and in this way avoid increasing the number of general accounts.

29. LEGAL EXPENSES.—To this account should be charged the amount of all attorneys' salaries, fees, and expenses, and all other incidental legal expenses incurred during the process of construction of a road, except when the expense can be charged directly to the account for which it is incurred.

30. INTEREST AND DISCOUNT.—To this account should be charged discount on securities sold; interest on loans effected, and on notes issued for construction purposes or overdue payments to contractors or other creditors, and discount, interest, and exchange on other commercial paper issued for a similar purpose. Premium realized from sale of bonds, stock, or other securities should be credited to this account. Discount or premium realized from sale of bonds, stock, or other securities for a specific work should be applied to such work.

31. GENERAL EXPENSES.—To this account should be charged organization expenses, and expenses incurred in the disposal of securities; salaries and expenses of general officers of a road under construction, clerks in general offices engaged on construction accounts or work, stationery, and office expenses; also all items of a special and incidental nature which cannot be properly located under any other account.

CLASSIFICATION OF EQUIPMENT EXPENDITURES.

1. LOCOMOTIVES.—To this account should be charged the cost of locomotives and tenders, including all appurtenances, furniture and fixtures necessary to equip them for service, purchased or built at the company's shops, including cost of transportation.

It does not include any locomotives purchased or built to take the place of those that have been worn out or destroyed.

2 PASSENGER CARS.—To this account should be charged the cost of coaches, chair cars and smoking cars, officers' and business cars, including all appurtenances, furniture and fixtures necessary to equip them for service, purchased or built at the company's shops, including cost of transportation.

It does not include any cars purchased or built to take the place of those that have been worn out or destroyed.

3. SLEEPING, PARLOR AND DINING CARS.—To this account should be charged the cost of buffet, sleeping, parlor, observation, cafe and dining cars, including all appurtenances, furniture and fixtures necessary to equip them for service, purchased or built at the company's shops, including cost of transportation.

It does not include any cars purchased or built to take the place of those that have been worn out or destroyed.

4. BAGGAGE, EXPRESS AND POSTAL CARS.—To this account should be charged the cost of baggage, milk, express, postal, and combination baggage and express, baggage and postal, or express and postal cars, including all appurtenances, furniture and fixtures necessary to equip them for service, purchased or built at the company's shops, including cost of transportation.

It does not include any cars purchased or built to take the place of those that have been worn out or destroyed.

5. COMBINATION CARS.—To this account should be charged the cost of combination passenger and baggage, passenger and express, or passenger and postal cars, including all appurtenances, furniture and fixtures necessary to equip them for service, purchased or built at the company's shops, including cost of transportation.

It does not include any cars purchased or built to take the place of those that have been worn out or destroyed.

6. FREIGHT CARS.—To this account should be charged the cost of freight cars of all classes, including all appurtenances, furniture and fixtures necessary to equip them for service, purchased or built at the company's shops, including cost of transportation.

Freight cars may be classified as follows:

Box,	Furniture,	Tank,
Coal,	Oil,	Other cars in freight service.
Caboose,	Ore,	
Flat,	Refrigerator,	
Fruit,	Stock,	

This account does not include any cars purchased or built to take the place of those that have been worn out or destroyed.

7. OTHER CARS OF ALL CLASSES.—To this account should be charged the cost of all classes of cars not properly chargeable to any of the preceding accounts, including all appurtenances, furniture and fixtures necessary to equip them for service, purchased or built at the company's shops, including cost of transportation.

The following is a list of the more important classes of cars coming under this heading, viz.:

Ballast plows or unloaders, including cables used therewith;	Iron shovels,	Rail saw,
	Locomotive tanks, retired from service, used permanently as water cars,	Rock crushers,
Boarding,		Snow plows (when not attachable to locomotives),
Bridge,		
Derrick,	Outfit,	Steam shovels,
Ditching,	Painters',	Tool,
Dynamometer,	Pile driver,	Water,
Gravel,	Plow and scraper,	Wrecking, etc.

This account does not include any cars purchased or built to take the place of those that have been worn out or destroyed.

8. FLOATING EQUIPMENT.—To this account should be charged the cost of marine or floating equipment of all kinds, such as steamships, steamboats, ferryboats, transfer boats, vessels, launches, tugs, barges, canal boats, car and other floats, dredges, lighters, scows, etc., including all appurtenances, furniture and fixtures necessary to equip them for service, purchased or built at the company's shops or yards, including cost of transportation.

It does not include any equipment purchased or built to take the place of that which has been worn out or destroyed.

9. DISCOUNT AND COMMISSION.—To this account should be charged discount on securities sold, commission on loans effected and on notes issued for equipment purposes; and discount and exchange on other commercial paper issued for a similar purpose. Premiums realized from sales of bonds, stock or other securities sold for equipment should be credited to this account. (Interest on equipment bonds, car trust notes or other equipment obligations should not be charged to this account.)

DETAILS OF ACCOUNTING IN CONNECTION WITH CONSTRUCTION WORK.

When a new line or extension is completed, the construction material that remains unused along such line or appertaining to it, with the transportation charges that have accrued thereon, should be carefully inventoried by the storekeeper in charge, after which he should invoice the same in detail to the local storekeeper assigned to take charge of it. The amount thus turned over should be credited to the account originally charged.

Construction accounts should be designated on distribution books and vouchers in the manner best likely to indicate their character and location, as say: "Construction of Blank depot, Blank division," or "Enlarging Blank coalhouse, Blank division," or "Extending platform, Blank station, Blank division." or "Improving depot grounds, Blank station, Blank division." In every case the designation should be so full and clear that the character of the charge may be accurately understood at headquarters, including location and other details, without further research or inquiry.

A separate account should be opened with each sidetrack constructed.

When sidings are constructed in common with the main

line, and the cost of each cannot be separately determined, it will be understood to be the average of the whole, after taking into consideration any special charges that may characterize the cost of either.

Upon old lines it would be well to keep a record of the actual number of lineal feet of new sidings laid and taken up each month, so that, at the end of the fiscal year, or whenever desired, an accurate report may be rendered by the person having charge of such accounts, of the total number of lineal feet laid in excess of the number of feet taken up, or *vice versa.*

An account should be opened with each locomotive or car constructed at a company's shops, as say, "New locomotive, No. 510, in course of construction."*

When a lot of locomotives or cars is in course of construction at the same time, and material and labor are being expended in common upon them, an account should be opened with the lot, as say, "New box cars, Nos. 982, 984, 986, in course of construction."

When a locomotive or car is completed, written notice of the fact should forthwith be sent to the accounting officer, giving the particulars and cost corresponding with the amount charged on the distribution books.

Each construction account that it may be necessary to open should not only be charged with the material, labor and other expense directly expended upon it, but it should also be charged with all expenditures incident to it, not otherwise provided for.

A separate account should be opened with each structure in the following cases, viz.: For each building, bridge, culvert, viaduct, dock, wharf, fence, group of interlocking switches, piece of real estate or right of way; for each locomotive, car, siding, telegraph line and tunnel.

In order to enable the accounting officer to keep himself advised of construction work in progress, and to distinguish between expenditures that should be charged to operating and those that should be charged to construction, a monthly return of all new work should be made to him;† if a new building is in course of construction, the fact should be stated; if it is being added to, improved, enlarged or rebuilt, the facts should be precisely given. The report should give the estimated cost of the proposed work; if it is to replace another

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* Inasmuch as rolling stock is seldom completed in the month in which the construction work is begun, the accounting officer should charge the expenditures monthly to a suspense account named "Rolling stock in course of construction," giving in detail the charges on each lot. Upon the completion of each lot he should transfer the total expenditures on the same from "Rolling stock in course of construction" to "Rolling stock."

† See Form 82, Appendix D.

structure, the original cost of such structure should be given, or if not known, the estimated cost thereof, with the name of the person making the estimate. If the work is an enlargement, improvement or addition, the nature of the betterment should be stated and what proportion of the same (if any) should be charged to operating expenses.

The greatest care is required to be exercised at all times to prevent charges being made to construction that belong in operating expenses, or *vice versa.**

* In order to avoid the confusion and labor that attend the opening of a construction account for petty additions, enlargements or improvements, and for other reasons, no charge is made to construction upon many lines for expenditures for merely nominal sums, all such improvements, additions, extensions and enlargements being charged as an operating account. The petty construction items that are treated in this way are those that are incurred subsequent to the original outlay, upon an old or completed line; thus, if after the lapse of a considerable period some slight addition, improvement, extension or enlargement is made to a building or other belonging of a company, it is charged as an operating expense. In the construction of new lines and extensions, however, charges are made to construction without reference to the amount.

CHAPTER XXX.

CLASSIFICATION OF OPERATING EXPENSES.

The operating expenses of a road include the cost of working a property and maintaining the same; they embrace the wages of men engaged in conducting the business, including cost of repairs and renewals and all expenses incident to the operation and maintenance of a property.

Charges should be entered in the month in which they occur. When this is impossible, then as soon afterward as the amount can be ascertained. They should be divided under the headings provided and in the order given in the classification of operating expenses.

In the event the classification of an expenditure is not known, it should be charged under an analogous head.

The utmost care should be exercised in classifying and apportioning expenses. If improperly done, the management is misled and the property suffers; if, on the other hand, it is accurately performed, it affords a reliable basis for intelligent investigation and comparison, and the correction of irregularities and extravagances.

The accompanying classification is the work of railway officers and the various railroad commissions of the United States. It is official. It took effect July 1st, 1894. It is the outgrowth of twenty years' agitation.*

The classification of expenses is as follows:

MAINTENANCE OF WAY AND STRUCTURES.

1. REPAIRS OF ROADWAY.—This account includes all expenditures for account of the roadbed and track (except cost of rails and ties), cost of loading and distributing rails and ties

* The particularity that is observed in specifying exactly what belongs under the various accounts or headings that follow is due largely to the railway commissioner from Michigan; the author of this book prepared for him the classification, substantially, as embodied herein. Its official adoption and recognition by him made its adoption general. The great amount of research and labor that attended this exposition is amply repaid by the uniformity of accounts that it insures, as every storekeeper, timekeeper and official connected with the expenditures of railroads knows, by reference to it, exactly where every item of expense should go in the accounts.

along the track, labor expended in cutting, slotting, and drilling (when done by trackmen), laying rails, ties, and other track material; sloping cuts, blasting rocks, and widening embankments; gathering old rails and scrap material, repairing and keeping tunnels in order, clearing track of snow and ice, cutting and removing weeds, brush, and grass from the company's right of way, plowing fire guards along track; proportion of salaries, traveling and office expenses of civil engineers, superintendents of tracks, resident or division engineers, their clerks, draftsmen, and other attendants; use and repairs of instruments (when not chargeable to Construction), and wages of roadmasters, their clerks, section foremen, track laborers, track watchmen, gravel-pit men, work-train engine and trainmen, and men employed in operating steam shovels, scrapers, pile drivers, and ditchers while engaged in track renewals and repairs; also cost of fuel, water, and other supplies used on work-train engines and cars, and cost of oil, tallow, and waste used on track (except oil used in switch lamps, which should be charged to Account No. 31, "Station Supplies").

It inc udes cost of ballast of all kinds; preparing, delivering, and putting same into track; also quarry, gravel, and sand pit rights and privileges (except cost of land), fixtures, tools, and other articles used in connection with the track, rail fastenings, semaphores, switch stands and fixtures, "block" and other systems of road or track signals, interlocking apparatus, signals and other appliances pertaining thereto, including those not owned, but maintained jointly with other railroads; tools and implements of trackmen and gravel-pit men; fuel and light, water, ice, and other supplies used in connection with the track, or in section houses, tool houses, watch houses, work trains while engaged in maintenance of roadway, etc., not otherwise provided for; riprapping, piling and piers (except around bridges and buildings), retaining walls, dikes, and breakwaters made to protect track, and labor and material used in protecting river banks and keeping track clear in cases of freshets and washouts; cost of boarding men at washouts; snow sheds and snow fences, and also the cost of filling trestles with earthwork (except when properly chargeable to Construction); and expenses for maintaining grade crossings of electric and steam railways (provided they are not street-railways).

When a track is taken up, the labor expended therefor should be charged to this account, whether another track is laid to replace it or not.

The following is a list of the more important articles used in connection with repairs of roadway, viz.:

Adzes,
Adz handles,
Augers,
Axes
Ax handles,
Ballast,
Bolts,
Braces and bits,
Brooms,
Brush hooks,
Bumper posts,
Cable wire,
Cant hooks,
Chains,
Chairs,
Chisels,
Claw bars,
Crow bars,
Curbing hooks,
Dippers,
Drawing knives,
Drills,
Fish or angle plates,
Fish or angle plate bolts,
Flags,
Frogs,
Gravel,
Grindstones,
Hammers,
Hand trucks,
Hatchets,
Hoes,
Jack levers,
Lanterns and fixtures,
Levels,
Lining bars,
Lumber,
Nails,
Nippers,
Nuts,
Nut locks,
Oil
Oil cans,
Padlocks,
Picks,
Pike poles,
Pinch bars,
Plows,
Punches,
Rail braces,
Raising bars,
Ratchet drills,
Riprap,
Rope,
Saws,
Scrap boxes,
Scythes,
Semaphores,
Semaphore lamps,
Shovels,
Sledges,
Spades,
Spikes,
Spike mauls,
Spot boards,
Splices,
Squares,
Staples,
Stone,
Stone drills,
Stoves and fixtures,
Straightening machines,
Switches, fixtures and appurtenances,
Tool boxes,
Switch lamps,
Switch ropes (when used in repairs of roadway),
Tamping bars,
Tapelines,
Tie plates,
Timber,
Tongs,
Torpedoes used by track repairers,
Track gauges,
Track jacks,
Velocipedes,
Vises,
Washers,
Washer irons,
Water barrels,
Water kegs,
Water pails,
Wheelbarrows,
Whetstones,
Wire,
Wrenches, etc.

2. RENEWALS OF RAILS.—This account includes the cost of rails, laid in main track or tracks, sidings, spurs, gravel, and repair tracks; in tunnels, depots, shop and other yards, shops and other buildings; on turntables, piers, wharves, track scales, inclines, bridges, trestles, and culverts; to and from coal chutes, coal pockets, fuel or water stations, etc., less the value of the old rails taken up; also the cost of inspection and transportation. Cost of guard rails should be charged to this account.

3. RENEWALS OF TIES.—This account includes the cost of cross and switch ties laid in main track or tracks, sidings, spurs, gravel and repair tracks; in tunnels, depots, shop and other yards, shops, and other buildings, etc.; on turntables, piers, wharves, track scales, inclines, bridges, trestles, and culverts; to and from coal chutes, coal pockets, fuel or water stations, etc.; also the cost of inspection and transportation.

4. REPAIRS AND RENEWALS OF BRIDGES AND CULVERTS.—This account includes all expenditures for account of repairs and renewals of bridges, trestles, and culverts, built by a railroad company to carry its tracks over any stream, road, street or other railroad, both substructure and superstructure (see in

this connection Account No. 5, "Repairs and Renewals of Fences, Road Crossings, Signs, and Cattle Guards"); expenses of locomotives, work trains, pile drivers, etc., while engaged in making such repairs; cost of repairs and renewals of piers, abutments, retaining walls, drainpipes, riprapping, dikes, etc., necessary to protect or strengthen bridges and culverts against ice, water, etc.; and the cost of cleaning the channel under bridges and culverts.

It includes also the wages of supervisor of bridges, his traveling and office expenses, bridge foremen, bridge watchmen, bridge tenders, etc.; supplies used in operation of bridges, such as brooms, lanterns, oil, oil cans, pails, tallow, waste, water barrels, etc.; and fuel for stationary engines at drawbridges. The cost of removing old bridges preparatory to the construction of new, and the cost of temporary or false work used in repairs or renewals of bridges and culverts are chargeable to this account, also cost of construction of new bridge to replace one burned, and cost of tools used exclusively in repairs of bridges.

The following are the principal classes of structures coming under this account, viz.:

BRIDGES.—Steel, iron, wood (Howe truss, combination, trestle, or pile).

CULVERTS.—Stone or brick arch; iron; earthenware, iron, or ordinary piping; open culvert.

The following is a list of the more important articles of material used in connection with bridges and culverts, viz.:

Bolts,	Iron hangers,	Piles,
Brick,	Iron thimbles,	Riprap,
Cables (iron and hemp),	Iron rods,	Sand,
Castings,	Lag screws,	Spikes,
Cement,	Lime,	Stone,
Dowels,	Lumber,	Timber,
Iron,	Nails,	Wood screws,
Iron braces,	Nuts,	Wrought washers, etc.
	Paints,	

5. REPAIRS AND RENEWALS OF FENCES, ROAD CROSSINGS, SIGNS, AND CATTLE GUARDS.—This account includes all expenditures for account of repairs and renewals of right-of-way fences, street railway and road crossings, overhead bridges built to carry any highway or track of another railroad over company's roadbed, roadways running under track, viaducts (foot and wagon), crossing drains, all signs (except station signs), whistle posts, slow boards, stop boards, mile posts, etc.; crossing gates, cattle guards, hedges, street lights, street repairs or sewers for which the company may be assessed or become responsible (excepting within the limits of station and shop grounds, which are chargeable to Account

No. 6, "Repairs and Renewals of Buildings and Fixtures"), and tools used by employes in making such repairs and renewals.

6. REPAIRS AND RENEWALS OF BUILDINGS AND FIXTURES.—This account includes all expenditures for account of repairs and renewals of all buildings used in connection with the operation of the road.

It includes wages or proportion of wages of the officer in charge of repairs of buildings, his traveling and office expenses, cost of excavation, foundations, drainage, water, gas, and sewer pipes, and stationary fixtures appertaining thereto; heating and lighting plant, apparatus, and fixtures; fences around station grounds, stock and fuel yards, shops, and other buildings; hydrants, cisterns, and wells for station and other buildings; grading, sewerage, laying out and improving grounds around stations, shops, and other buildings, paving yards adjacent to buildings, street lights, street paving, repairs or sewers for which the company may be assessed, or become responsible at points within the limits of grounds considered as belonging to stations, shops, or other buildings of the same class, or on streets surrounding such grounds or buildings (otherwise the charge should be to Account No. 5, "Repairs and Renewals of Fences, Road Crossings, Signs, and Cattle Guards"); also the expense of removing old buildings, preparatory to the construction of new.

The following is a list of the structures referred to above:

Baggage rooms,
Boarding houses for section men,
Boilers and boiler houses for supplying steam for heating cars, heating water for cleaning cars, etc.
Breakwaters for protection of buildings,
Dry houses,
Dwelling houses
Eating houses,
Elevators,*
Engine houses,
Express buildings,
Fire-engine houses,
Fuel houses,
General offices,
Grain cribs,
Grain warehouses,
Hand-car houses,
Ice houses,
Inclines for fuel and other purposes,
Interlocking towers,
Oil houses and tanks,
Outhouses,
Permanent signal-station buildings,
Platforms,
Rail mills,
Roundhouses,
Sand houses,
Sand driers,
Scrap houses,
Section houses,
Shops of all kinds,
Shop and station grounds and yards (draining, filling, etc.),
Sidewalks,
Stables,
Stationary engine houses,
Station houses (passenger and freight),
Stock pens,
Storehouses,
Switch houses,
Telegraph offices,
Turntables,
Warehouses,
Watchhouses,
Water stations.

The expense of repairs and renewals of furniture and fixtures used in buildings included under this head, not otherwise provided for herein, should also be charged to this ac-

* Except elevators, the net earnings of which are excluded from freight revenue.

count. Some of the more important of these items are as follows:

Awnings,
Carpets,
Chairs,
Clocks,
Coal boxes,
Counters,
Cranes (steam, hand and mail),
Curtains,
Derricks,
Desks,
Fire extinguishers,
Ice boxes,
Lighting fixtures,
Looking glasses,
Mats,
Matting,
Office railings,
Pigeonhole cases,
Racks,
Safes,
Scales (track, warehouse and platform),
Settees,
Shelving and other fixtures,
Signs at stations,
Stationary engines and boilers (except for running machinery),
Stoves and stove furniture,
Tables,
Ticket cases, etc.

Expenditures for the following items, when used in repairs or renewals of water stations, or in connection with water supplies for any purpose, should be charged to this account, viz.:

Boilers and machinery for pumping engines, cisterns, hydrants, pipe lines, pipes, ponds, pumping engines, pump fixtures, pumps, springs, tanks, towers, tubs, wells, windmills, etc.; also the expense of protecting pipes and of prospecting for water supply.

Expenditures for the following items when used in repairs or renewals of buildings used for fuel houses or sheds should be charged to this account, viz.:

Chutes, coal bins, coal buckets, cranes, derricks, pockets, screens, wood racks, etc.; also dumping, hoisting and other machinery and the necessary tools in connection therewith.

7. REPAIRS AND RENEWALS OF DOCKS AND WHARVES.—This account includes all expenditures for account of repairs and renewals of docks, wharves, piers, sheds thereon and inclines thereto, jetties, etc., and of repainting the same; repairs and renewals of freight carriers used in connection with the above, and of the engines necessary to operate the same; also the expense of operating pile drivers, tugs, barges, floats, dredges, mud scows, etc., while engaged in making such repairs, and in dredging to preserve proper depth of water.

8. REPAIRS AND RENEWALS OF TELEGRAPH.—This account includes all expenditures for account of repairs and renewals of the telegraph and telephone lines owned by the company, or for which it is responsible, including poles, wire, insulators, instruments, battery jars, switch boards and appurtenances, telegraph signs, telegraph tables, climbers, and all other appurtenances in connection therewith forming a part of the plant; also the wages of employes engaged in keeping the line in working condition, the cost of their tools, and proportion of the salary, traveling, and office expenses of superintendent and assistant superintendent of telegraph, and clerks.

9. STATIONERY AND PRINTING.—This account includes all expenditures for stationery, stationery supplies, and printing.

including books, blank forms, etc., used in connection with "Maintenance of Way and Structures."

[A list of the more important articles of stationery and printing will be found under Account No. 45, "Stationery and Printing."]

10. OTHER EXPENSES.—This account includes incidental expenditures only; that is to say, such expenditures in connection with "Maintenance of Way and Structures" as are not properly chargeable to any of the foregoing accounts. It includes material used in a laboratory attached to a machine shop when not specifically chargeable to any one particular account.

MAINTENANCE OF EQUIPMENT.

11. SUPERINTENDENCE.—This account includes the salaries and expenses of the superintendents of motive power and car departments, auditor of motive power and machinery, master mechanics, master car builders, general foremen, when salaries can not be properly charged to specific accounts; their clerks and attendants; also incidental expenses of their offices, such as fuel, light, etc.

12. REPAIRS AND RENEWALS OF LOCOMOTIVES.—This account includes all expenditures for account of repairs, renewals, and rebuilding of locomotives, tenders, snowplows (when attached to locomotives), furniture, and loose and movable tools and supplies used in connection therewith.

It also includes repairs of a "pusher" engine and tender belonging to another road over which trackage rights are granted.

It also includes the cost of locomotives, tenders, and appurtenances thereunto belonging, built or purchased to make good the original number charged to construction or equipment, including royalties for patents, steam and other power brakes and brake fixtures, less the value of old material, insurance, or repayments from other roads.

The following is a list of the more important articles used in connection with repairs and renewals of locomotives, viz.:

Air brakes,
Air-brake fixtures,
Arch pipes,
Arm rests,
Ash hoes,
Ash pans,
Ash-pan rods,
Bar (buggy),
Bar (pinch),
Bar (plugging),
Bar (slash),
Bells,
Bell bases,
Bell cords,
Bell-cord hangers,
Bell yokes,
Blower cocks,
Blower pipes,
Blow-off cocks,
Boilers,
Brakes,
Brake shoes,
Branch pipes,
Brasses,
Brooms,
Bumpers,
Bumper blocks,
Bumper sheets,
Cab angle irons,
Cab brackets,
Cab curtains,
Cab cushions,
Cab fronts,
Cab handles,
Cab lamps,
Center castings,
Center pins,
Chafe irons,
Check castings,
Check chambers,
Check valves,
Clocks,
Coal grates,
Counterbalances,
Coupling bars,

Crank pins,
Crossheads,
Crosshead pins,
Crown bars,
Crown-bar braces,
Crown sheets,
Cylinders,
Cylinder casings,
Cylinder cocks,
Cylinder-cock rods,
Cylinder heads,
Cylinder rings,
Dampers,
Damper handles,
Decks,
Domes,
Dome casings,
Dome covers,
Drag irons,
Dragpins,
Drawbars,
Drawbar castings,
Driving axles,
Driving boxes,
Driving-box brasses,
Driving-box cellars,
Driving-box wedges,
Driving wheels,
Dry pipes,
Eccentrics,
Eccentric rods,
Eccentric straps,
Equalizing levers,
Equalizing springs,
Exhaust pipes,
Expansion clamps,
Extension front ends,
Feed pipes,
Feed-pipe cocks,
Feed-pipe hangers,
Feed-pipe hose,
Feed-pipe shaft,
Fire boxes,
Fire-box doors,
Fire-box grates,
Fire bricks,
Fire pumps,
Flagstaffs,
Flues,
Flue sheets,
Footboards,
Frames,
Frame braces,
Front ends,
Front-end doors,
Front-end rings,
Front-end timber,
Gaskets,
Gauge cocks,
Gibs,
Glands,
Glass gauges,
Gongs,
Goose necks,
Grate bars,
Grate shakers,
Guide bars,
Guide blocks,
Guide braces,
Guide yokes,
Hammers (hard and copper),
Hand-hole plates,
Hand rails,
Hand-rail pedestals,
Headlights,
Headlight brackets,
Headlight fixtures,
Headlight pedestals,
Heater cocks,
Heater pipes,
Hose,
Hose jackets,
Hose reels,
Injectors,
Injector nozzles,
Inclines,
Jacket bands,
Jacket lagging,
Jacks,
Jackscrews,
King pins,
Lamps (steam and water gauge),
Lazy cocks,
Levers,
Link blocks,
Link lifters,
Lubricators,
Oak packing,
Oil-can stands,
Oil cups,
Oil-house cups and brasses,
Oil pipes,
Packing hooks,
Packing irons,
Packing rings,
Pet cocks,
Pet-cock rods,
Petticoats,
Petticoat pipes,
Pilots,
Pilot braces,
Pilot-draw castings,
Piston-follower heads,
Piston heads,
Piston-packing pumps,
Piston rods,
Pokers,
Pump barrels,
Pump cages,
Pump chambers (top and bottom),
Pump plungers,
Pump valves,
Quadrants,
Quadrant stands,
Reach rods,
Reverse latches,
Reverse levers,
Rocker arms,
Rocker boxes,
Rods (main and connecting),
Rod keys,
Rod straps,
Running boards,
Running-board braces,
Safety beams and castings,
Safety chains,
Safety hooks,
Safety levers,
Safety valves,
Sand boxes,
Sand-box bases,
Sand-box casings,
Sand-box covers,
Sand-box pipes,
Sand-box rods,
Seat boxes,
Sledges,
Slide valves,
Slide-valve rods,
Slide-valve yokes,
Smoke arches,
Smoke-arch braces,
Smoke-arch rings,
Smokestacks,
Smokestack bases,
Smokestack cones,
Springs,
Spring balances,
Spring hangers,
Spring saddles,
Stay bolts,
Steam brakes,
Steam chests,
Steam-chest covers,
Steam-chest hangers,
Steam gauges,
Stop cocks,
Stuffing boxes,
Swing bolsters,
Tee heads,
Tenders,
Tender brake hangers,
Tender brake-hanger boxes,
Tender brake shoes,
Tender brake wheels,
Tender cocks and rods,
Tender frames,
Tender wheels and axles,
Throttle levers,
Throttle pipes,
Throttle valves,
Tires,
Tool boxes,
Torches,

Trucks,	Truck wheels,	Wrenches (common, packing, air-brake, spanner, rod, set-screw, eccentric, and injector), etc.
Truck axles,	Tumbling shafts,	
Truck boxes,	Water-gauge cocks,	
Truck braces,	Wheel guards,	
Truck cellars,	Whistles,	
Truck jaws,	Wire netting,	

13. REPAIRS AND RENEWALS OF PASSENGER CARS.—This account includes all expenditures for account of repairs, renewals, and rebuilding of passenger cars of all classes, including woodwork, axles; brake fixtures, brakes (hand, air and other), brasses, buffet fittings, fixtures, and appurtenances, heating and lighting apparatus, links, pins, oil boxes, springs, trucks, wheels, windows, window fixtures, repainting, and other expenditures of a like nature; also proportion of wages of car inspectors and cost of tools used in inspecting cars at stations and elsewhere; proportionate cost of tools used by car repairers at repair stations for making light repairs, such as jackscrews, sledges, wrenches, and other expenditures of a like nature; also repairs made to cars of other lines for damages, or payments made for foreign cars wrecked or destroyed on the line; furniture and fixtures of passenger cars built or purchased to make good the original number of cars charged to construction or equipment; and also the cost of passenger cars replacing those worn out or destroyed, less the value of old material, insurance, or repayments from other roads.

Passenger cars may be classified as follows, viz.:

Baggage,	Combination (passenger and baggage),	Express,
Business	Dining,	Emigrant,
Chair,	Pay,	Mail,
Milk,	Postal,	Tourist,
Officers',	Sleeping,	Other passenger train cars.
Parlor (drawing room),	Smoking,	
Passenger (all classes),		

The following is a list of the more important articles of passenger-car furniture and fixtures, viz.:

Bell cord,	Cuspidors,	Matting,
Bell-cord hangers,	Drawheads,	Racks,
Carpets,	Ice boxes,	Seats,
Chairs,	Keys,	Stoves,
Check boxes,	Lamps,	Stove furniture,
Coal boxes,	Lamp fillers,	Toilets,
Coal hods,	Lamp fixtures,	Wash basins,
Curtains,	Lamp shears,	Water tanks,
Cushions,	Linoleum,	Window fixtures, etc.

14. REPAIRS AND RENEWALS OF FREIGHT CARS.—This account includes all expenditures for account of repairs, renewals, and rebuilding of freight cars of all classes, including wood work, axles, brake fixtures, brakes (hand, air and other), brasses, double-decking cars for stock, grain doors, links, pins,

couplers, oil boxes, springs, trucks, wheels, repainting, and renumbering; proportion of wages of car inspectors and cost of tools used in inspecting cars at stations and elsewhere; proportion of cost of tools used by car repairers at repair stations for making light repairs, such as jackscrews, sledges, wrenches, and other expenditures of a like nature; repairs to cars of other lines for damages, or payments made for their cars wrecked or destroyed on the line; furniture and fixtures for cabooses; and the cost of freight cars replacing those lost, worn-out, or destroyed, less the value of old material, insurance, or repayments from other roads. It also includes all expenditures for repairs and renewals of loose or movable furniture and fixtures belonging to caboose cars.

Freight cars may be classified as follows, viz.:

Box,	Fruit,	Refrigerator,
Caboose,	Furniture,	Stock (including palace),
Coal,	Oil,	Water and tank (when used as commercial cars).
Dump (commercial, coal or stone),	Ore,	
	Platform,	

15. REPAIRS AND RENEWALS OF WORK CARS.—This account includes all expenditures for account of repairs, renewals, and rebuilding of work or service cars; repairs and renewals of woodwork, repainting, axles, brakes (hand, air and other), and other fixtures, brasses, heating and lighting apparatus, links, pins, oil boxes, springs, trucks, wheels, windows, window fixtures and other expenditures of a like nature; repairs of commercial cars when assigned to and in service of "Maintenance of Way and Structures" department, including cost of changes made in such cars to fit them for this service; and the expense of refitting them for commercial service.

Work and service cars may be classified as follows, viz.:

Ballast plows or unloaders, including cables used therewith.	Iron shovels,	Rock crushers,
	Lever cars,	Snowplows (when not attached to locomotives),
	Locomotive tanks used permanently as water cars,	Steam shovels,
Boarding,	Outfit,	Tool,
Bridge,	Painters',	Water,
Derrick,	Pile drivers,	Wrecking,
Ditching,	Plow and scraper,	Other work cars.
Dump,	Push,	
Gravel,	Rail saw,	
Hand,		

16. REPAIRS AND RENEWALS OF MARINE EQUIPMENT.—This account includes all material and labor necessary to maintain marine or floating equipment in efficient working order, including repairing (both ordinary and that made necessary by wrecks or accident) hulls, decks, cabins, masts, rigging, sails, and other parts of steamships, steamboats, ferryboats, transfer

boats, vessels, tugs, barges, car and other floats, scows, etc.; also for repairing boilers and engines, wood foundations, bearings for machinery, wheels, rudders, shafts, steering, gear, ventilators, electric plants, steam and hot-water heating fixtures and appurtenances, royalties paid for use of patents on improved machinery, raising sunken boats, etc.

The following is a list of the principal items of furniture and fixtures used in repairs and renewals of marine or floating equipment, viz.:

Axes, barometers, beds and bedding, block and tackle, capstan bars, carpets, chairs, charts, clocks, compasses, copying presses, counters, desks, engine furnishings, fire extinguishers, flue cleaners, gang planks, hatchets, hooks, life-preservers, lines, linoleum, logs and log lines, matting, oil cans, pianos on passenger boats, pokers, racks, railings, safes, scales, scrapers, settees, shovels, splice bars, spyglasses, stoves and stove furniture, tables, ticket cases and fixtures, tool boxes, tools, wrenches, and other analogous articles.

17. REPAIRS AND RENEWALS OF SHOP MACHINERY AND TOOLS.—This account includes all expenditures for account of renewals, repairs, and maintenance of boilers, stationary engines, scaffolds, shafting, belting, and other appliances for running machinery, furnaces, forges, and all machinery in car and locomotive shops, in roundhouses, when used exclusively for repairing locomotives, and in carpenter shops of the Bridge and Building Department; also all tools and fixtures used in connection therewith; oil, tallow, and waste used in lubricating and cleaning tools and machinery.*

18. STATIONERY AND PRINTING.—This account includes all expenditures for stationery, stationery supplies, and printing, including books, blank forms, etc., used in connection with "Maintenance of Equipment."

[A list of the more important articles of stationery and printing will be found under Account No. 45, "Stationery and Printing."]

19. OTHER EXPENSES.—This account includes all expenditures for account of electric lights, gas, torches, and lamps used in machinery department shops, roundhouses and offices, and the oil and material for the same; proportion of labor and material for the proper operation and repair of electric lights used in connection with other departments; wages of engineers and firemen and cost of fuel and water in operation of stationary engines or boilers for supplying power and heat to shop buildings and roundhouses (other fuel used in shops

*NOTE.—Small hand tools used by mechanics and soon worn out, also wages of persons in charge of same, should be charged to the account mostly benefited by their use; and wages of sweepers, cleaners, roustabouts, and other unskilled laborers employed on general work in and about locomotive, machine, boiler, copper, sheet iron, tin, smith, car, carpenter, paint, pattern, and other shops, fuel for forges and other analogous items, should be apportioned between the different "Maintenance of Equipment" accounts, on basis of relative amount of work done for the account of each.

being charged into the cost of manufactured material); wages paid watchmen engaged in watching machinery department shops; cleaning vaults connected with shops; cost of material used in a laboratory attached to a machine shop where no special account is benefited; and all "Maintenance of Equipment" expenses which can not be properly classed under any of the foregoing heads.

CONDUCTING TRANSPORTATION.

20. SUPERINTENDENCE.—This account includes all expenditures for account of salaries and expenses of general superintendents (when engaged exclusively in the operating department), assistant general superintendents, division superintendents, assistant superintendents, superintendents of transportation, masters of transportation, superintendents of car service, car accountants, train masters, traffic managers, assistant traffic managers, general freight agents, assistant general freight agents, general passenger agents, assistant general passenger agents, general ticket agents, assistant general ticket agents, general baggage agents, superintendents of express, or other officers engaged exclusively in the transportation department, their clerks, porters, and attendants; also incidental expenses of their offices, such as heating, lighting, ice, water, rent, express charges, etc., provisions and other expenses of special cars when in use by such officers; also expenses of Car Service Associations.

21. ENGINE AND ROUNDHOUSE MEN.—This account includes wages of all engineers and firemen while engaged in running all locomotives except those engaged in work-train service; also the wages and traveling expenses of traveling engineers, wages of hostlers, callers, watchmen, and employes engaged in wiping, cleaning, firing up, dumping, boiler washing, cleaning fire boxes, watching and dispatching locomotives, and all other roundhouse employes, such as smokestack inspectors, roundhouse cleaners, ash pit or clinker pit cleaners, clinker dumpers, operators of turntables, etc.; also the wages paid engineers and firemen on a "pusher" engine furnished by another road over which trackage rights are granted.

22. FUEL FOR LOCOMOTIVES.—This account includes the cost of fuel consumed by all locomotives except those engaged in work-train service, including freight charges on same and the wages of fuel agents, their clerks, and employes engaged in handling and accounting for the same; also tools, such as wheelbarrows, shovels, picks, brooms, axes, saws, forks, oil cans, stoves and lamps; coal and wood for heating; oil, tallow, etc., for lighting fuel stations; also cost of coal used on

a "pusher" engine furnished by another road over which trackage rights are granted.

23. WATER SUPPLY FOR LOCOMOTIVES.—This account includes the cost of water furnished all locomotives except those engaged in work-train service, including the cost of labor and material required in operating, heating, and lighting water stations; oil, waste, and other supplies for operating pumping machinery; tools, etc. (when not chargeable to Account No. 6, "Repairs and Renewals of Buildings and Fixtures"), and amounts paid to other companies for water furnished to locomotives, water rights, and privileges; also water furnished a "pusher" engine belonging to another road over which trackage rights are granted, and cost of water used in roundhouses for washing out locomotive boilers.

24. OIL, TALLOW, AND WASTE FOR LOCOMOTIVES.—This account includes the cost of oil, tallow, waste, wool, grease, rags, etc., used in lighting, cleaning, and lubricating all locomotives except those engaged in work-train service, and expense of similar supplies on a "pusher" engine furnished by another road over which trackage rights are granted.

25. OTHER SUPPLIES FOR LOCOMOTIVES.—This account includes the cost of furniture, tools, and other movable articles and supplies required fully to equip all locomotives except those engaged in work-train service, as chisels, files, lampblack, packing material, sand, soap, and switch keys; also axes, brooms, brushes, crowbars, flags, frogs, hatchets, jacks, lantern globes, lanterns, links, pins, matches, metal and other polishes, oil cans, picks, scoops, shovels, shunting poles, switch chains, switch ropes, tallow buckets, tin boxes for flags, torpedoes, water buckets, etc., and expense of similar supplies on a "pusher" engine furnished by another road over which trackage rights are granted.

26. TRAIN SERVICE.—This account includes the wages of conductors, train agents, ticket collectors, baggagemen, brakemen, train porters (not on private cars), water carriers, and other trainmen engaged in running all trains except work trains, or in making up or distributing trains.

27. TRAIN SUPPLIES AND EXPENSES.—This account includes all expenditures for account of heating, lighting, cleaning, and lubricating cars, including the cost of supplying or pumping gas into cars, and oil and wicking for lanterns of trainmen; uniforms and badges for trainmen when paid for by the company; laundry work for cars, icing refrigerator cars, transferring or rearranging freight in transit for safety in transportation, etc.; miscellaneous supplies furnished to cars for the purpose of protection against accidents and fires, and for keeping the cars clean; bedding for stock cars and wages of car cleaners and car oilers; provisions and supplies for snow-

bound trains or trains delayed by washouts, trackage or pilot service paid to other roads during washouts, transfer of passengers on account of defective track or bridges; also cost of maintaining and operating temporary facilities in connection with transporting freight and passengers over a stream where a bridge has been destroyed; also oil, tallow, waste, wool, grease, sulphur, sponges, rags, packing hooks and irons, dope buckets, and other supplies and tools used in cleaning and lubricating cars.

This account also includes any deficit from operation of dining cars.

It also includes all expenditures for miscellaneous supplies furnished trains necessary fully to equip them for service. The following is a list of the more important train supplies, viz.:

Axes,	Hatchets,	Sledges,
Bell cords,	Ice,	Soap,
Brooms,	Jacks,	Straw and sawdust,
Brushes,	Jackscrews,	Switch chains,
Bull's-eyes,	Lanterns,	Switch keys, for trainmen.
Candles,	Lantern fixtures,	Switch ropes,
Chains,	Matches,	Tallow buckets,
Cold Chisels,	Oil cans,	Torpedoes,
Conductor's punches,	Packing hooks,	Train tool boxes.
Dunnage,	Pails,	Water buckets,
Fire buckets,	Punches,	Wrenches, etc.
Flags,	Saws,	
Frogs,	Scoops,	
Hammers,	Shovels,	

28. SWITCHMEN, FLAGMEN, AND WATCHMEN.—This account includes the wages of yard masters and clerks, yard foremen, yard conductors, yard brakemen, yard switchmen, switch tenders, callers, watchmen and detectives, station policemen, signalmen, crossing-gate keepers, crossing flagmen, and track flagmen (when the service is performed in connection with "Conducting Transportation"), and wages of such employes paid on account of joint use of track owned by another company.

29. TELEGRAPH EXPENSES.—This account includes all expenditures for account of operation of telegraph and telephones, such as rent paid for use of telegraph and telephone lines, and for telephone tolls at stations; salaries and expenses of division operators, of train dispatchers, clerks, telegraph operators, and messengers; cost of chemicals, copper, zincs, and other supplies for charging batteries; fuel, light, and other supplies for telegraph offices; proportion of salaries and expenditures of superintendent and assistant superintendent of telegraph, their clerks and attendants, and miscellaneous supplies, traveling and office expenses; also amounts paid for services of such employes on other roads over which trackage rights are granted.

When an employe connected with the telegraph service

also acts as station agent, clerk, or in any other capacity, an apportionment of his wages should be made to this and other accounts on the basis of service rendered.

30. STATION SERVICE.—This account includes salaries and expenses of freight and ticket agents in charge of stations, assistant agents, depot or station masters, assistant depot or station masters, station passenger agents, station baggage agents, assistant station baggage agents, and other officials occupying analogous positions; wages of cashiers, clerks, collectors, ticket examiners, ticket collectors and ushers, station foremen, baggagemen, station gatemen, employes in package and parcel rooms, men attending electric lights, janitors, porters, warehousemen, freighthouse foremen, freight callers, tallymen, deliverymen, car sealers, weighmasters, truckmen and other laborers, teamsters, messengers, scalemen, coopers, cleaners, employes at coal dock terminals, enginemen for stationary engines used for heating and lighting station buildings; also, employes engaged in carrying and weighing mail, caring for switch lights, loading, unloading, bedding, feeding, and watering stock; labor at stockyards or stock pens, except as covered by Account No. 42, "Stock Yards and Elevators," cleaning vaults connected with stations, payments for transferring freight by contract or otherwise, and other analogous expenses, also amounts paid for services of such employes on other roads over which trackage rights are granted.

31. STATION SUPPLIES.—This account includes all expenditures for account of heating and lighting depots, waiting rooms, freight and passenger offices, and other station buildings; fuel and supplies for engines operating freight carriers on docks, wharves and piers to convey freight between boats and cars; supplies used for station and yard signals, switches, switch lights, street lights, semaphore lamps, etc., also bills of municipalities or other corporations for lighting highway crossings; supplies and implements for handling freight; payments for water, sprinkling about stations, uniforms and badges for employes when paid for by the company; drayage, horses, feeding and shoeing horses, bedding, feed, and water for stock at stockyards or stock pens except as covered by Account No. 42, "Stock Yards and Elevators;" premium on bonds of agents and other station employes, when paid by the company, and other analogous items; also, amounts of this character paid to other companies where trackage rights are granted.

The following is a list of the more important articles included under station supplies, viz.:

Axes,	Brooms,	Car seals,
Baggage checks,	Brushes,	Chair cushions,
Baggage crates,	Bulletin boards,	Chalk,
Baggage trucks,	Candles,	Check boxes,

Coal hods,
Cold chisels,
Copying presses,
Counter brushes,
Counter scales,
Cups,
Cupboard catches,
Curtains,
Cuspidors,
Dating stamps (office),
Dippers,
Dusters,
Electric lights,
Electric-light supplies,
Extinguishers (hand),
Files (document),
Fire buckets,
Flags,
Freight trucks,
Gas,
Hammers,
Harness,
Hatchets,
Hooks,
Hose,
Hose couplings,
Ice,
Ice chests,
Ice tongs,
Keys,
Lampblack,
Lamps,
Lamp fittings,
Lamp supplies,
Lanterns,
Lantern fittings,
Letter boxes,
Locks,
Looking glasses,
Mail bags,
Marking brushes,
Marking pots,
Marline,
Mats,
Matches,
Measures,
Nails,
Newspapers,
Oil,
Oil cans,
Pails,
Platform trucks,
Reflectors,
Rubber hose,
Saws,
Scoops,
Scrubbing brushes,
Shovels,
Skids,
Sledges,
Soap,
Spades,
Sponges,
Sprinkling cans,
Stools,
Stove blacking,
Switch chains and ropes
Switch keys, for yardmen
Tacks,
Tarpaulins,
Ticket stamps,
Tongs,
Torpedoes,
Towels,
Twine,
Wagons,
Warehouse trucks,
Wash basins,
Waste,
Water barrels,
Water bowls,
Water cans,
Water coolers,
Water pails,
Wheelbarrows,
Wrenches, etc.

32. SWITCHING CHARGES—BALANCE.—This account represents the net balance paid to other companies for switching cars or locomotives.

33. CAR PER DIEM AND MILEAGE—BALANCE.—This account represents the net balance paid to other companies, firms, or individuals for use of cars interchanged on the per diem or mileage basis.

34. HIRE OF EQUIPMENT—BALANCE.—This account represents the net balance paid for use of equipment other than that accounted for under Account No. 33, "Car Per Diem and Mileage—Balance."

35. LOSS AND DAMAGE.—This account includes charges for loss, damage, delays, or destruction of freight, parcels, express matter, baggage, and other property intrusted for transportation (including live stock received for shipment), and all expenses directly incident thereto; cost of repacking and boxing damaged freight and baggage, feed for delayed stock (except when delayed in wrecks), etc.; wages and expenses of employes engaged either as adjusters or otherwise, and payments for the detection of thieves; charges for damages to or destruction of crops, buildings, lands, fences, vehicles, or any property other than that intrusted for transportation, whether occasioned by fire, collision, overflow, or otherwise; also expenditures for account of cattle and other live stock killed or injured by locomotives or trains while crossing or trespassing on the right of way, removing and burying the same; also

services and expenses of employes or others while engaged as witnesses in case of suits.

36. INJURIES TO PERSONS.—This account includes all charges on account of employes or other persons killed or injured, such as gratuities and compensation paid to injured or disabled persons, their guardians, heirs, relatives, and attorneys; salaries and expenses of chief surgeons, assistant surgeons, division surgeons, attendants, etc., fees and expenses of doctors, coroners, undertakers, witnesses, and others (except lawyers' fees and court expenses);* nursing and hospital attendance, medical and surgical supplies, funeral expenses, railroad fares when sending injured persons home or elsewhere, and expenses of attendant when necessary; payments made for ejectment from trains; services, and expenses of employes or others engaged as witnesses or otherwise in connection with the adjustment of claims coming under this head.

37. CLEARING WRECKS.—This account includes all expenditures for account of clearing wrecks, cost of labor and material required to replace wrecked equipment upon the track, and the attendant expenses of wrecking trains and wrecking tools used in connection therewith; building temporary tracks around wrecks, amounts paid to other companies for detouring trains on account of wrecks, reloading or transferring freight, baggage, mail, etc., provisions, board, etc., for men clearing up or watching at wrecks, meals or board for passengers delayed on account of wrecks, feed for stock delayed in wrecks, and other analogous expenses.

38. OPERATING MARINE EQUIPMENT.—This account includes all expenditures for account of the operation of steamships, steamboats, vessels, ferryboats, transfer boats, tugs, barges, car and other floats, scows, etc. (excepting boats while in use on construction work), such as fuel and supplies therefor; wages of officers, crews, and all other employes rendering service on marine or floating equipment; dockage when not loading or discharging cargoes, canal lock and basin dues, rental of boats, labor pumping out boats laid up, cost of transferring cargoes in case of accident, steamboat inspection, license, customs dues, health inspection, clearance dues, payments for towage, lighterage, etc., and any other miscellaneous expenses of a similar nature not properly chargeable to Account No. 16, "Repairs and Renewals of Marine Equipment."

The following is a list of the principal items of supplies chargeable to marine or floating equipment, viz.:

Axes,	Commissary supplies,	Grease,
Bed linen,	Cooking utensils,	Handspikes and other tools,
Binnacle lamps,	Flags,	

* NOTE.—See Account No. 51, "Law Expenses."

Hose,
Ice,
Lamps,
Laundry,
Oil,
Planks,
Provisions,
Rags, etc., for lighting and lubricating purposes,
Shovels,
Stores,
Tablecloths,
Tableware,
Tallow,
Trucks,
Waste,
Water,
Wool, etc.

This account includes, also, all expenses for account of miscellaneous service, supplies, and expenses in connection with the operation of wharves and docks, such as wages of port captains, port stewards, agents, their clerks and attendants, baggage agents, check clerks, porters, coopers, warehousemen, laborers, watchmen, longshoremen, roustabouts, and other labor at wharves and docks engaged in handling freight, operating steam or other power for handling freight, etc.; payments for the use of power (not furnished by the company) in loading and discharging cargoes, and all expenditures incident to lighting and heating in connection with the operation of wharves and docks.

The following is a list of the principal items used in connection with the operation of wharves and docks, viz.:

Axes,
Block and tackle,
Brooms,
Brushes,
Bulletin boards,
Chalk,
Clocks,
Coal hods,
Cold chisels,
Cooper's tools,
Crowbars,
Electric lights,
Fire apparatus,
Fire buckets,
Freight hooks,
Gas,
Hammers,
Hatchets,
Hose,
Hose couplings,
Ice,
Ice chests,
Ice tongs,
Lamps,
Lanterns,
Marling,
Marking brushes,
Marking pots,
Matches,
Measures,
Nails,
Oil,
Oil cans,
Pails,
Ropes,
Salt,
Saws,
Scoops,
Shovels,
Skids,
Sledges,
Soap,
Spades,
Sprinkling cans,
Stools,
Tacks,
Tarpaulins,
Towels,
Trucks,
Twine,
Waste,
Water,
Water barrels,
Water cans,
Water coolers,
Wheelbarrows, etc.

39. ADVERTISING.—This account includes salaries and expenses of traveling passenger and other advertising agents, bill posting, etc.; cost of printing and publishing passenger time-tables for general distribution, printing of advertising matter, advertising in newspapers and periodicals (excepting notice of stockholders' meetings, election of directors, publishing reports in newspapers, and other corporation and financial notices of a general character),* bulletin boards, cards, cases, cords, display cases, dodgers, folders, glasses, handbills, maps, pamphlets, photographs, posters, racks, and frames, tacks, views, postage and express charges on adver-

* NOTE.—See Account No. 53, "Other Expenses."

tising matter; also premiums and donations to fairs and stock shows, immigration boards, and other analogous expenditures for attracting traffic.

40. OUTSIDE AGENCIES.—This account includes all expenditures for account of salaries and expenses of agents engaged exclusively in the procurement of competitive business, and employes of their offices, traveling agents and solicitors, when located on or employed off the line of the road; furniture, supplies, stationery, rents, office expenses, including rents of telephones and telephone tolls, and other disbursements of a similar nature, on account of such agencies; also expenses of fast freight lines, traffic associations, and other analogous items.

41. COMMISSIONS.—This account includes all payments to agents of other companies and outside parties, not employes of the company, in the form of commissions for services appertaining to either freight or passenger business; but should not include commissions paid to the company's own agents in lieu of salary, such being chargeable to Account No. 30, "Station Service," or Account No. 40, "Outside Agencies," as the case may be.

42. STOCK YARDS AND ELEVATORS.—This account includes wages, cost of supplies, and all other expenses incurred in the operation of stock yards or elevators, except stock yards and elevators the net earnings of which are excluded from freight revenue.*

43. RENTS FOR TRACKS, YARDS, AND TERMINALS.—This account includes rents paid for lease of tracks, yards, and terminals.

TRACKS.—Under "tracks" are included all payments to other lines for rent or use of their tracks for running trains, whether by a fixed charge per month or per year, proportion of interest on valuation and expense incurred in maintaining such track, or on a train mileage basis (not including temporary use of track, such as trackage paid to other roads in case of wrecks, washouts, snow blockades, defective bridges, etc.)

YARDS.—Under "yards" are included all payments for use of high and low tracks, delivery tracks, repair tracks, and other side tracks at points other than terminals.

TERMINALS.—Under "terminals" are included all payments for use of facilities at terminal points, including main tracks, side tracks, delivery tracks, repair tracks, freighthouse facilities, and proportion of payments for handling freight, union depot facilities, etc., at terminal points.

44. RENTS OF BUILDINGS AND OTHER PROPERTY.—This account includes all payments for rent of buildings, land, and

* NOTE.—By "Stock Yards," as used in this account, should be understood stock yards where stock is stored, fed, watered, reshipped or sold, usually at junction or terminal points.

other property when such property is used in connection with the operations of the road, such as depot grounds and buildings, union depots, general and other offices, docks, wharves, ferry landings, elevators, stock yards, fuel yards, repair shops, etc.

45. STATIONERY AND PRINTING.—This account includes all expenditures for stationery, stationery supplies, and printing, including books, blank forms, employes' time-tables, tariffs, tickets, waybills, and other analogous items, when used in connection with "Conducting Transportation."

The following is a list of the more important items chargeable to the several accounts of "Stationery and Printing," viz.:

Arm rests,
Blank paper,
Blank tablets,
Blank cards,
Binders,
Blotters,
Blotting paper,
Calendars,
Caligraphs,
Carbon paper,
Cards,
Cardboard,
Circulars,
Classifications,
Copy (impression) books,
Copying brushes,
Cyclostyles,
Dating stamps,
Delivery tickets,
Electric pens,
Envelopes,
Eyelets,
Eyelet punches,
Erasers,
Fuel tickets,
Hectographs,
Indexes,
Ink,
Inkstands,
Invoice books,
Legal-cap paper,
Letter paper,
Manifold paper,
Mimeographs,
Mucilage,
Mucilage brushes,
Neostyles,
Notices,
Numbering stamps,
Oil paper,
Orders,
Paper,
Paper baskets,
Paper clips,
Paper cutters,
Paper fasteners,
Paper files,
Paper weights,
Papyrographs,
Pencils,
Pencil erasers,
Pens,
Penholders,
Penracks,
Pins,
Postage,
Pounce,
Printed cards,
Printed tablets,
Punches,
Rubber bands,
Rubber stamps,
Rulers,
Ruling pens,
Scrapbooks,
Sealing wax,
Seals,
Shears,
Shipping tags,
Shorthand books,
Sponges,
Sponge cups,
Stylographs,
Tape,
Telegraph blanks,
Tissue (impression) paper,
Train order blanks,
Typewriters,
Waste baskets,
Water holders,
Wrapping paper, etc.

46. OTHER EXPENSES.—This account includes incidental expenditures only; that is to say, such expenditures in connection with "Conducting Transportation" as are not properly chargeable to any of the foregoing accounts.

GENERAL EXPENSES.

47. SALARIES OF GENERAL OFFICERS.—This account includes the salaries of general officers. The following is a list of such officers: Chairman of board, president, vice-presidents, general counsel, assistant general counsel or general solicitor, assistant general solicitor, secretary, general manager and assistant general manager, chief engineer, general superintend-

ent (when in full charge of operations of the road), comptroller, assistant comptroller, general auditor, auditors, assistant auditors, freight auditor, passenger auditor, purchasing agent, general storekeeper, stationer, treasurer, assistant treasurer, local treasurer, and land commissioner.

Receiver's fees also are included in this account.

48. SALARIES OF CLERKS AND ATTENDANTS.—This account includes salaries of clerks, attendants, etc., of the officers specified under Account No. 47, "Salaries of General Officers," including paymasters, cashiers, tax agents, traveling auditors and local storekeepers; also wages of porters, cooks, etc., for special cars while in use by general officers and by general office employes, etc.

49. GENERAL OFFICE EXPENSES AND SUPPLIES.—This account includes all expenditures for account of heating and lighting the offices of the general officers; expenses of general officers, their clerks and attendants; also all expenses incident to the care and supply of the general offices, including expenses and supplies of pay car and special cars while in use by general officers and general office employes.

50. INSURANCE.—This account includes all expenditures for account of premiums for insuring property of the company, and property which is intrusted to it; also for insuring passengers and others, and employes, against accident or death.

51. LAW EXPENSES.—This account includes the salary and expenses of solicitors, attorneys, their clerks and attendants, and all expenses of their offices, such as law books, printing briefs, legal forms, testimony, reports, etc.; also fees and retainers paid for services of attorneys who are not regular employes of the company, and amounts paid to arbitrators for the settlement of disputed questions, costs of suits, special fees, notarial fees, expenses connected with taking depositions, and all legal and court expenses of every kind not otherwise provided for herein,* including expenses of clerks, sheriffs, constables, or other court officers, as taxed by the court against the railroad company.

52. STATIONERY AND PRINTING (GENERAL OFFICES).—This account includes the cost of printing annual reports, blank books, blank forms, contracts, leases, bonds, stock certificates, paper, stationery, stationery supplies, etc., used only in general offices and not chargeable to other accounts.

[A list of the more important articles of stationery and printing will be found under Account No. 45, "Stationery and Printing."]

53. OTHER EXPENSES.—This account includes incidental expenditures only; that is to say, such expenditures in connection with "General Expenses" as are not properly chargeable to any of the foregoing accounts; also cost of publishing no-

* NOTE.—See Account No. 36, "Injuries to Persons."

tices of stockholders' meetings, of election of directors, of dividends, publishing annual reports in newspapers, and other corporation and financial notices of a general character; and fees and expenses paid to directors, etc.

The official classification of operating expenses of the government of the United States and of the several state governments, given in detail in the foregoing, may be recapitulated in brief as follows:

I. MAINTENANCE OF WAY AND STRUCTURES.

1. Repairs of Roadway.[1]
2. Renewals of Rails.
3. Renewals of Ties.
4. Repairs and Renewals of Bridges and Culverts.
5. Repairs and Renewals of Fences, Road Crossings, Signs and Cattle Guards.
6. Repairs and Renewals of Buildings and Fixtures.
7. Repairs and Renewals of Docks and Wharves.
8. Repairs and Renewals of Telegraph.
9. Stationery and Printing.
10. Other Expenses.

II. MAINTENANCE OF EQUIPMENT.

11. Superintendence.
12. Repairs and Renewals of Locomotives.
13. Repairs and Renewals of Passenger Cars.
14. Repairs and Renewals of Freight Cars.
15. Repairs and Renewals of Work Cars.
16. Repairs and Renewals of Marine Equipment.
17. Repairs and Renewals of Shop Machinery and Tools.[2]
18. Stationery and Printing.
19. Other Expenses.[3]

III. CONDUCTING TRANSPORTATION.

20. Superintendence.[4]

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1. Railroad companies may for their own use subdivide this account as follows: "Engineering and superintendence," "Track maintenance," "Applying track material," "Roadway cleaning and policing," "Ballast," "Track Fastenings," "Track tools," "Repairs of interlocking plants" and "Repairs of block signals."

2. Railroad companies may for their own use subdivide this account as follows: "Repairs of shop machinery and tools," "Oil, waste and tallow used on tools and machinery."

3. This account may be subdivided as follows: "Heating and lighting shops," "Watchmen" and "Incidentals."

4. This account may be subdivided between "Superintendence—Transportation" and "Superintendence—Traffic."

21. Engine and Roundhouse Men.[1]
22. Fuel for Locomotives.[2]
23. Water Supply for Locomotives.
24. Oil, Tallow and Waste for Locomotives.
25. Other Supplies for Locomotives.
26. Train Service.[3]
27. Train Supplies and Expenses.[4]
28. Switchmen, Flagmen and Watchmen.[5]
29. Telegraph Expenses.[6]
30. Station Service.[7]
31. Station Supplies.[8]
32. Switching Charges—Balance.
33. Car Per Diem and Mileage—Balance.[9]
34. Hire of Equipment.
35. Loss and Damage.[10]
36. Injuries to Persons.
37. Clearing Wrecks.
38. Operating Marine Equipment.
39. Advertising.
40. Outside agencies.[11]
41. Commissions.
42. Stock Yards and Elevators.
43. Rents for Tracks, Yards and Terminals.
44. Rents of Buildings and Other Property.

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1. Railroad companies may for their own use subdivide this account as follows: "Road engineers and firemen," "Yard engineers and firemen," "Wipers and dispatchers," "Other roundhouse laborers."

2. This account may be subdivided as follows: "Fuel for road locomotives," "Fuel for yard locomotives" and "Operation of fuel stations."

3. Railroad companies may for their own use subdivide this account as follows: "Passenger conductors," "Passenger baggagemen," "Passenger brakemen," "Freight conductors," "Freight brakemen."

4. Railroad companies may for their own use subdivide this account as follows: "Passenger train supplies," "Freight train supplies," "Oil, waste and tallow used on passenger cars," "Oil, waste and tallow used on freight cars."

5. Railroad companies may for their own use subdivide this account as follows: "Switchmen," "Flagmen," "Watchmen."

6. This account may be subdivided between "Telegraph expenses" and "Telephone expenses."

7. Railroad companies may for their own use subdivide this account as follows: "Agents," "Clerks at stations," "Laborers at stations."

8. This account may be subdivided as follows: "Station supplies," "Signal supplies" and "Highway crossing supplies."

9. Railroad companies may for their own use subdivide this account as follows: "Passenger car per diem and mileage—Balance," "Freight car per diem and mileage—Balance."

10. Railroad companies may for their own use subdivide this account as follows: "Damage and loss of freight," "Damage and loss of baggage," "Damage to property" and "Stock killed or injured."

11. Railroad companies may for their own use subdivide this account as follows: "Outside agents," "Expenses of traffic associations."

45. Stationery and Printing.[1]
46. Other Expenses.

IV. General Expenses.

47. Salaries of General Officers.
48. Salaries of Clerks and Attendants.
49. General Office Expenses and Supplies.
50. Insurance.
51. Law Expenses.
52. Stationery and Printing (General Offices).
53. Other Expenses.

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1. This account may be subdivided between "Stationery and printing —Transportation" and "Stationery and printing—Traffic."

CHAPTER XXXI.

DIFFICULTY OF APPORTIONING OPERATING EXPENSES TO PARTICULAR PORTIONS OF A LINE.

A classification of railway expenses about which there shall be no question, about which disputes will not arise, is an impossibility. When we attempt to apportion expenses between particular parts of a road, we encounter still graver questions, difficulties at once inherent and insurmountable.

The suggestion that the cost of operating parts of a road might be determined separately from the whole road had its origin in the practice among railway companies of making an approximate division of this kind, for the purpose of ascertaining, in a general way, the relative economy exercised by local officers in reference to expenses within their control. But no one advised of the situation ever attempted a separation of this kind for any other purpose, or indeed for such purpose, unless based on the natural divisions of a property. Companies do not and cannot draw imaginary lines across their roads and apportion expenses within such lines upon an equitable basis, no matter what the object of the division may be.

Railways in the attempt to make a division of their expenses, apportion to particular divisions on an arbitrary basis items common to all, after ascertaining that which is actual. They do this, as already stated, to ascertain approximately the relative economy exercised by officers in matters which they individually control, and this is the extent to which railway companies attempt to estimate the cost of operating particular parts of their properties.

The first obstacle that confronts us in attempting a division of expenses is the impossibility of apportioning the cost of management equitably among the several divisions of a road. The item is both a large and an important one, covering, as it does, the guardianship of the property. We will take the stationery and other supplies used at headquarters as an illustration. They serve no valuable purpose in themselves, have no earning capacity and add nothing to the original enterprise. The essence of value in a railroad is its transportation facilities, the parts that earn money, its trains, traffic warehouses, buildings, tracks and employes who handle its business. All other expenses are accessory, artificial; contrib-

ute nothing to the essential conditions of the enterprise. Yet they must be considered. General office expenses cannot be accurately apportioned among the divisions of a road, because the benefit conferred is too vague, too indefinite, too fluctuating.

In all attempts to determine the cost of operating particular divisions of a road (for the purpose of fixing local responsibility) expenses of a general character beyond the control of the officers are apportioned to divisions on a basis common to all. Local expenses are charged where they belong. Under these two methods, partly fictitious, partly actual, the responsibility of local officers is in a measure determined.

The common expenses of a railroad are not divisible. As soon might we attempt to determine the relative amount of nourishment that we derive in the economy of life from particular kinds of food, or determine the comparative amount of wear and tear that our bodies sustain from various classes of labor, as to attempt to determine to what particular division many of the expenses of a railroad are chargeable. The sources of information are too much covered up, the tracing of cause and effect too remote, the results too subtle to enable us to determine their force or measure their effect.

Only information in reference to the expenses of a railway property, as a whole, is worthy of credit. Any attempted separation of cost as between divisions can only be approximately true at best, and to furnish it to the public is, therefore, to mislead, and in so far as this is the case, it is more likely to injure than benefit.

The cost of operating a particular line or section of road is the material, labor and expense disbursed. The most ingenious and patient efforts have been made to devise a system whereby these expenditures might be correctly apportioned, but without success.

To determine the cost of operating particular portions of a road requires information that does not exist; it presupposes information in reference to things that are in their nature indefinite or so surrounded with qualifications and conditions as to preclude the obtaining of accurate data. In order to ascertain the cost of any particular thing we must determine the proportion of common expenses chargeable to it, and to make the allotment accurate we must apportion these expenses, not upon any agreed or arbitrary basis, but upon the basis of facts. To each particular thing about which we wish to know we must assign the actual outlay incurred on its behalf. This means that we must take cognizance of the expenditure of time in connection with it of every official; must follow his thoughts and measure their cost to the carrier. His expenses must be divided with equal care. We must follow this minute

espionage into all the ramifications of the service wherever an outlay is incurred. This must be done not only in regard to the officials of a company, but it must be followed out with equal conscientiousness with all operatives engaged in duties affecting two or more divisions.

The difficulties of the situation are not generally known and are lightly appreciated in the majority of cases by seekers after knowledge of this character. They would too often supply lack of information by arbitrary formulas. These substitutes are more or less absurd according to the intelligence of the compiler and the amount of time and money expended in making the compilation. They never possess any real value. The compiler, as he progresses in his labor, discovers at every step that the bulk of the common expenses of railroads must be apportioned to divisions (if apportioned at all) on arbitrary and, therefore, fictitious grounds. If those who use such information know how it was compiled, they will not attach any value to its conclusions. They know that material and wages are oftentimes charged to an object, on the basis that the gross income of such object bears to the gross income of some other object, or on the basis that its physical proportion bears to the physical proportion of something else, without any reference to the real merits of the case.

It is not difficult to apportion an expense where it belongs exclusively to some particular part of a property, but the moment that it becomes common between two or more divisions, that moment the determination of the relative cost belonging to each becomes impossible. Money expended in attempting such divisions of cost is not only unworthily bestowed, but is a menace to the company interested, and to the community as well. The conclusions reached mislead, and for that reason are no more to be encouraged than a watchman of a railroad should be encouraged to display a neutral signal when one that indicated danger should be used instead. To publish such matter is to disseminate fictitious information; to commit an indiscretion or a misdemeanor, for the reason that the information may, at any time, be used by honest men as well as dishonest ones to predicate actions that may greatly injure those it affects. Thus, upon information not in any respect reliable, not in any way worthy of regard, rates may be based and other fundamental acts performed. It is this particular feature of the case that renders every intelligent and experienced railway manager loath to have information made public that is not true in its conclusions; so simple, so frank, so manifest, that no one whether honestly inclined or otherwise, can be misled or make improper use of it.

No one can be more sensible than those filling positions of responsibility, whether under a government or otherwise, that

matter embodied in exhibits, whether as information or otherwise, may at any moment be made the basis for determining grave responsibilities or forming the basis of accusations alike unjust and unwarranted. This is especially and markedly so in reference to everything that affects the interests of corporate properties or that throws light upon their operations. A table professing to furnish information in reference to the economic working of a railroad, compiled perhaps to satisfy the reasonable curiosity of an official, under the mistaken belief that its conclusions were fair, might be made the means of retarding a prospective industry, or crippling an enterprise in which millions of capital were embarked. It is this aspect of the case that makes the owners of railways hesitate to furnish information not absolutely of a reliable character.

The impossibility of apportioning the expense of maintaining equipment and machinery (almost twenty per cent.) affords a good illustration of the obstacles that beset an attempt to divide expenses between different divisions of a road. There is no good basis for apportioning this expense. The wear and tear of equipment and machinery, and the outlay attending its operation, are directly and in a marked manner dependent upon the use made of it; upon the character of the road over which it passes; the nature of the track, its alignment, grades, ballast, ditches, rails, ties, splices, elevation, the speed of trains, the weight of traffic, climatic changes, and finally the intelligence, faithfulness and experience of the men in charge. These are the factors that determine cost, and they never exist in the same ratio upon any two sections of a road, or upon any two roads. Consequently it needs no illustration or subtle argument to demonstrate that to divide the cost of maintaining equipment operated indiscriminately over two or more sections of a road upon the basis of its carrying capacity, the number of miles run, the mileage of the road itself, or other arbitrary basis, is only to delude ourselves. The cost of wear and tear must be charged, to make the statement of value, to divisions, not upon a hypothetical basis, but according to actual damage sustained. But as the track upon no two divisions is relatively the same, nor kept up to the same standard, nor subject to the same conditions, it necessarily follows that the wear and tear of equipment is always different.

But for the unimportant uses railroad companies make of the so-called divisions of expense it is the general practice to divide the cost of maintaining equipment upon the basis of miles run. But such a division, however plausible, is delusive. Under its operation, sections or divisions of a line that are operated at a loss from year to year might show a net profit and properties utterly worthless be made to rank in productiveness with those really valuable.

About twelve per cent. of the expenses of railways is for fuel for locomotives. The price of this at point of delivery to the company varies; the haul to point of distribution by the company also varies. The units of heating power also vary. It results from this—the fuel being used in common—that it is impossible to determine the cost on the different divisions of a property. Moreover where locomotives run over two or more divisions it is impossible, in accounting, to determine how much coal is consumed on each; for the consumption is not equal because of difference in the physical character of the road and rate of speed, haul, etc.

What has been said in regard to the impossibility of dividing the cost of maintenance of equipment, cost of fuel, etc., applies also to expenditures for advertising, foreign agents, and similar contingencies, comprising perhaps five per cent. of the expenses. It is impossible, in the majority of instances, to apportion these expenses to particular lines. They are general in one sense, and yet do not affect different parts of the property alike.

It would perhaps satisfy the statistician's purpose to apportion these disbursements arbitrarily over the whole property on the basis of earnings or relative expenses, yet such a division would be fallacious, because the value of a property and its responsibilities are not determinable by what we may say it earns or expends, but by what it does actually earn or expend. We must be careful not to clothe railroad enterprises with attributes they do not possess. While it may be convenient for us to say that we will apportion the cost of advertising or stationery on the basis of earnings or expenses, yet as a matter of fact we have no right to apportion such outlay, except upon the basis of actual outlay; or if we do apportion them otherwise, it should be done with a full knowledge of the error committed.

Continuing the inquiry in reference to a separation of expenses between the divisions of a road, upon what basis should the wear and tear of cars used on other lines be apportioned? How are we to determine the extent of this wear and tear? Again, how shall we apportion the use of other companies' cars? On the basis of the traffic earnings of each car, undoubtedly. But this method of division is impracticable because of the great cost of ascertaining such earnings. Innumerable cases of a similar nature might be cited.

A large portion of the telegraph expenses (amounting to some two per cent. of the gross expenses) are of a general nature. A separation of them can never be more than approximately correct, for the reason that the machinery of this department involves every division. Any apportionment of cost of operating, to be worthy of regard, must take cogni-

zance, from hour to hour, of the actual outlay of time and material, of each unit of expense. This is manifestly not practicable.

This is equally true in regard to the wages of employes at junctions of different divisions; of the trainmen who run over two or more divisions, and the expense of such trains as well. It does not require any extended inquiry to satisfy the inquirer that these expenses cannot be apportioned accurately to the division to which they belong. Ninety per cent of the time of these employes will perhaps be occupied in connection with traffic that does not net as much to the company as business discharged upon another division during the remainder of their time. The earnings (derived from their labor) would afford a safe basis for apportioning the expense, but this labor is so interwoven that its accurate separation is impossible without infinite labor and outlay.

What is said of employes at junctions applies also to the material consumed at these points and upon lines operated in common by two or more divisions. It is true of trainmen running over two or more sections of a road; the number of miles they run can never be the real basis of their wages. They are paid for the work they perform and the number of hours they are occupied, but the primary purpose of their employment is their ability to earn money for their employer, and this is the true basis for determining the apportionment of cost to the different divisions of a road over which they run. It cannot be done truly on the basis of aggregate earnings. The particular earning in which they appear as factors is the true basis. Thus the expenses of trainmen operating over two or more divisions should be charged to such divisions on the basis that the earnings of the train on each division bear to the earnings of the whole train. In order to apportion expenses of this nature, much of the clerical work must be performed at the time and on the ground, and no matter how painstaking and exhaustive it may be, the result will only approximate correctness.

Apportionment of many common expenditures must be upon the basis of the purpose they serve from the standpoint of earnings. Manifestly this is not to be ascertained except after the most intelligent and far-reaching inquiry. And while it may be determinable in some instances, it cannot be in others. To attempt to decide it out of hand or on the basis of something thought to be generally near the mark, is to beg the question, is to deceive ourselves and mislead those who make use of the data under the mistaken belief that it affords a correct basis.

Considerable sums of money that every corporation pays annually for losses and damages connected with traffic can-

not be accurately apportioned. The carrier knows that the property came into his possession, and that when delivered it was in bad order, or that it was not delivered at all. He knows he is responsible for the damage or loss, but is unable to say where the damage or loss occurred. In attempting to apportion the disbursements, he must fix it arbitrarily upon some division, or divide it among several divisions upon a basis that he thinks fair. This disposition of the case is all right if he seeks simply to find a hole in which to hide the expense. But to say seriously that a particular piece of property may be burdened with such an outlay merely to satisfy the necessities of accounts, is to attach an exaggerated importance to a thing of no consequence in itself; to create fictitious values or responsibility; to do business upon a false basis; to make bookkeeping superior to events.

Another feature of railway operation which precludes the possibility of determining the cost of operating particular divisions of a road is the transportation of a company's material. Divisions located near the sources of supply must haul large quantities of fuel, rails, ties, etc., for use in the operation of divisions not so situated. The expense of hauling such supplies should of course be charged to the division which uses them, but it is obviously impossible to determine the cost of this service, since such material is handled in common with commercial freight—ordinarily in the same trains. The expense of the service would not be the same on different parts of the road, nor on the same line at different times. To determine the cost of hauling the company's material would necessarily require that the proportion of each item of the operating expenses entering into the cost of the service should be definitely known—a manifest impossibility. The expense of maintaining the track and equipment, for example, is too little affected by the traffic handled to be accurately ascertained per unit of service rendered—per ton per mile. If the hauling of a company's material were not a large item in itself, an average rate might be determined (based on the results for a comparatively long period of time), which would approximately represent the cost of this service;* but on most roads this class of freight constitutes a large proportion of the total tonnage moved—about twelve and one-half per cent. It is therefore one of the most important of the many insurmountable obstacles in the way of an accurate apportionment of the operating expenses of a railroad between the various branches and divisions thereof.

What is here stated is a very imperfect exposition of the

* Such a method as suggested above is treated of more particularly in the chapter in this volume on "Transporting company's material and employes, and accounting therefor."

subject, and it is possible that, in the evolutions of railway science, means may be found for overcoming some of the obstacles pointed out, but until such period all statements professing to exhibit the cost of working particular portions of a property operated in common with other portions are delusive.*

So much may be said in reference to the attempt to apportion expenses between several divisions of a road. I do not attempt to exhaust the subject. A division may be made that will be of value to a company, as already explained, for purposes of determining the relative economy exercised by local officers in matters coming wholly within their control. I have attempted to outline such a division below. It has no other purpose. The object sought is entirely different from one having actual division of cost in view. In the former instance it serves as a help in fixing responsibility for outlays; in the latter, it may mislead as to the value of a property.

Many expenses may be charged with absolute accuracy to a particular line or division. The work of the accountant, in such cases, is easy. In those cases where the disbursement is not apportionable upon an entirely equitable basis (because of the variableness of the service or the peculiar circumstances that attend the case), we must determine in advance, for each particular kind of expense, what basis will be used in dividing whenever it becomes necessary to make such a division.

In order to arrive at the information we seek and fix the responsibility sought, all expenditures that particular managers are not responsible for must be charged to divisions on a common basis. This will place managers on an equal footing.

In the accompanying rules it is designed that the storekeepers, road accountants and others shall open an account with each division for each class of expense incurred on its behalf. When the amount chargeable to a division is known, it is to be charged under its appropriate head, thus: "Renewals of rails—Central division." When it is not known, the charge will be apportioned at headquarters. In such cases the entry made on the distribution book by the storekeeper or accountant would be "Renewals of rails—Common" or "Renewals of rails—Central and Eastern divisions," or such explanation made as may be necessary to enable the accounting officer to understand the matter.

With these explanations I proceed to point out, in detail, how each expense account may be apportioned to the different

* For partial list of expense accounts that embrace more or less items that are common to all divisions of a road, see Appendix E.

divisions, or should be entered in the distribution book for division afterward at headquarters by the proper officials.

MAINTENANCE OF WAY AND STRUCTURES.

REPAIRS OF ROADWAY.
RENEWALS OF RAILS.
RENEWALS OF TIES.
REPAIRS AND RENEWALS OF BRIDGES AND CULVERTS.
REPAIRS AND RENEWALS OF FENCES, ROAD CROSSINGS, SIGNS AND CATTLE GUARDS.

Expenditures provided for under the foregoing accounts should be charged in the distribution books to the accounting division upon which the expense is incurred.

The expense of maintaining facilities used in common by two or more accounting divisions should be apportioned in the distribution books between the accounting divisions benefited, according to the use made of such facilities by each—such proportion to be determined in each case by the superintendents of the divisions affected, subject to the approval of the general accounting officer.

All charges to any of the above accounts which represent the salaries and office expenses (including clerk hire) of officials whose jurisdiction extends over more than one accounting division, should be apportioned in the distribution books between the accounting divisions benefited, as nearly as possible in the same proportion that the time of such officials is given to the affairs of each division—the proportion to be determined monthly by the officials concerned, according to the circumstances in each case, subject to the approval of the superintendents of the divisions affected.

Traveling expenses should be charged to the particular accounting divisions on account of which the expenses are incurred. When incurred in common for all divisions over which the official's jurisdiction extends, they should be apportioned on the same basis as that prescribed for the apportionment of his salary.

Any expenses chargeable to the foregoing accounts which are common to all divisions of the road should be reported as "Common to Whole Road." Such charges should be apportioned between the several accounting divisions by the general accounting officer, on the basis of the relative gross train ton-mileage on each division during the last preceding twelve months.*

* Gross train ton-mileage is the number of tons hauled one mile—including the tonnage of locomotives, tenders, cars and contents.

REPAIRS AND RENEWALS OF BUILDINGS AND FIXTURES.

The cost of repairing buildings which are used exclusively in the operation of a particular accounting division should be charged in the distribution books to such division.

The expense of maintaining the buildings at terminal and junction points which are used in common by two or more accounting divisions, such as engine houses, fuel and water stations, etc., should be apportioned in the distribution books between the accounting divisions benefited, according to the use made of such facilities by each—such proportion to be determined in each case by the superintendents of the divisions affected, subject to the approval of the general accounting officer.

Repairs of buildings used in common by the whole road, such as general office buildings, locomotive and car shops, storehouses, tie treating plants, etc., should be reported as "Common to Whole Road." Charges of this nature should be apportioned between the several accounting divisions by the general accounting officer, on the basis of the relative gross train ton-mileage on each division during the last preceding twelve months.

Charges to this account for salaries and expenses of officials whose jurisdiction extends over more than one accounting division should be apportioned as directed under the account "Repairs of Roadway."

REPAIRS AND RENEWALS OF DOCKS AND WHARVES.

Charges to this account should be handled in the same manner as prescribed for "Repairs of Roadway."

REPAIRS AND RENEWALS OF TELEGRAPH.

Expense of this nature should be charged in the distribution books to the accounting division upon which the expense is incurred.

Charges for maintaining the facilities at common points, as at the junction of two or more accounting divisions, should be apportioned in the distribution books between the divisions benefited, according to the use made of such facilities by each—such proportion to be determined in each case by the superintendent of telegraph, subject to the approval of the general accounting officer.

Expenses common to all divisions should be reported as "Common to Whole Road." Such charges should be apportioned between the several accounting divisions by the general accounting officer, on the basis of the relative telegraph wire mileage on each division.

STATIONERY AND PRINTING.

OTHER EXPENSES.

Expenses provided for under the above accounts which are incurred exclusively in connection with the operation of a particular accounting division should be charged in the distribution books to such division.

Every item of expense chargeable to the above accounts which is common to two or more accounting divisions, but not common to all, should be apportioned in the distribution books between the accounting divisions concerned—the basis of apportionment (unless otherwise provided) to be determined according to the circumstances in each case by the superintendents of the divisions affected.

Expenses common to all divisions should be reported as "Common to Whole Road." Such charges should be apportioned between the several accounting divisions by the general accounting officer, on the basis of the relative gross train ton-mileage on each division during the last preceding twelve months.

MAINTENANCE OF EQUIPMENT.

SUPERINTENDENCE.

All charges to this account should be reported as "Common to Whole Road." Such charges should be apportioned between the several accounting divisions by the general accounting officer, on the basis of the relative charges to each division for repairs of locomotives, cars, ferry boats, etc., during the current month.

REPAIRS AND RENEWALS OF LOCOMOTIVES.

Repairs of locomotives are divided into four classes, viz.: (1) "Running repairs," amounting to, say, less than $75.00 at one time in shop; (2) "Light repairs," covering expenditures of $75.00 to $250.00 at one time in shop; (3) "Heavy Repairs," $250.00 to $750.00; and (4) "General repairs," $750.00 and over.

An accurate account should be kept in the distribution books with each locomotive, to which should be charged all expenditures made in keeping such engine in repair. Charges in the distribution books should specify the nature of the repairs made in each instance, and in case a locomotive receives repairs of more than one class in the same month, a separate account should be opened for each in the distribution books. A separate recapitulation should be made for each class of repairs, showing the amount charged for such repairs to each engine.

Repairs of the first named class should be apportioned be-

tween accounting divisions on the basis of the mileage made by the individual engine on each division during the current month. Repairs of the other three classes should be apportioned on the basis of the mileage made by the individual engine since last receiving repairs of the same or a heavier class.

The cost of extraordinary locomotive repairs necessitated by accidents should be charged to the accounting division responsible therefor—the responsibility to be determined by the superintendents of the divisions affected, or, in case of disagreement, by their superior officer.

Charges to this account for expenses which are not chargeable to particular locomotives, as cost of repairing snowplows, extra tanks, etc., should be apportioned between the several accounting divisions, on the basis of the relative locomotive mileage on each division during the last preceding twelve months.

The cost of new locomotives purchased for renewals should be apportioned between the various accounting divisions on the basis of the mileage made on each division by the locomotives they replace.

REPAIRS AND RENEWALS OF PASSENGER CARS.
REPAIRS AND RENEWALS OF FREIGHT CARS.

The cost of extraordinary repairs to cars necessitated by accidents should be charged in the distribution books to the accounting division responsible for same—the responsibility to be determined by the superintendents of the divisions affected, or, in case of disagreement, by their superior officer.

All charges to the above accounts, except those provided for in the foregoing paragraph, should be reported as "Common to Whole Road," and the apportionment between accounting divisions should be made by the general accounting officer on the basis of the relative passenger car mileage and relative freight car mileage, respectively, on each accounting division during the last preceding twelve months.

REPAIRS AND RENEWALS OF WORK CARS.

The cost of repairing damage to work cars caused by wrecks, etc., should be charged in the distribution books to the accounting division responsible for the accident—the responsibility in each case to be determined by the superintendents of the divisions affected, or, in case of disagreement, by their superior officer.

Ordinary repairs of cars of this class should be charged in the distribution books to the accounting division upon which the cars are being used.

The cost of heavy and general repairs of work cars, also new cars purchased for renewals, should be reported as "Common to Whole Road." Such charges should be apportioned between accounting divisions by the general accounting officer, on the basis of the relative gross train ton-mileage on each accounting division during the last preceding twelve months.

REPAIRS AND RENEWALS OF MARINE EQUIPMENT.

Expenses of this nature should be charged in the distribution books to the accounting division for which such equipment is operated. If operated in common for two or more accounting divisions the expense should be apportioned between such divisions on a percentage basis to be determined, according to the particular circumstances in each case, by the superintendents of the divisions affected, subject to the approval of the general accounting officer.

REPAIRS AND RENEWALS OF SHOP MACHINERY AND TOOLS.
STATIONERY AND PRINTING.
OTHER EXPENSES.

All charges to the above accounts should be reported as "Common to Whole Road." Such charges should be apportioned between the several accounting divisions by the general accounting officer, on the basis of the relative charges to each division for repairs of locomotives, cars, ferry boats, etc.; in the case of "Repairs and Renewals of Shop Machinery and Tools" the charges for the last twelve months should be used as the basis; and in the case of the other accounts above the charges for the month in which the expense to be apportioned is incurred.

CONDUCTING TRANSPORTATION.

SUPERINTENDENCE.

All expenses of this nature which are wholly on account of a particular accounting division should be charged in the distribution books to such division.

The salaries and office expenses of officials and employes whose services are rendered in common for two or more accounting divisions, but not common to all, should be apportioned in the distribution books between the accounting divisions benefited, as nearly as possible in the same proportion that the time of such officials and employes is given to the affairs of each division—the proportion to be determined according to the circumstances in each case by the superintend-

ents of the divisions affected, subject to the approval of the general accounting officer.

Traveling expenses should be charged to the accounting division on account of which the expense is incurred. Such expenses incurred by an official in common for all the divisions over which his jurisdiction extends should be apportioned on the same basis as that prescribed for the apportionment of his salary.

Expenses which are common to all divisions of the road should be reported as "Common to Whole Road." Such charges should be apportioned between the several accounting divisions by the general accounting officer, on the basis of the relative gross train ton-mileage on each division during the current month.

ENGINE AND ROUNDHOUSE MEN.

The time of engineers and firemen in road service should be charged in the distribution books to the accounting divisions over which they run. When a trip extends over more than one accounting division, the time for such trip should be apportioned between the several divisions according to the number miles run on each.

The wages of engineers and firemen engaged in yard switching service should be charged in the distribution books to the accounting division for which the service is performed. At points where such service is performed in common for two or more accounting divisions, the expense should be apportioned between such divisions on a percentage basis—the proportions to be determined, according to the particular circumstances in each case, by the superintendents of the divisions affected, subject to the approval of the general accounting officer.

Roundhouse expenses incurred wholly on account of a particular accounting division should be charged in the distribution books to such division.

At engine-houses where the facilities are provided and services rendered in common for two or more accounting divisions, such common expenses should be divided in the distribution books between the accounting divisions benefited; the cost of wiping engines on the basis of the number of engines wiped for each accounting division; the cost of washing out locomotive boilers on the basis of the number of engines washed out for each accounting division; and the wages of locomotive dispatchers and all other roundhouse employes provided for under the above account on the basis of the number of engine arrivals account of each division.

Roundhouse expenses incurred on account of engines run-

ning in common over two or more accounting divisions should be apportioned in the distribution books between the divisions affected, according to the number of miles run by such engines over each.

FUEL FOR LOCOMOTIVES.

Fuel delivered to locomotives in road service should be charged to the accounting division on which such engines are employed. If running in common over more than one accounting division, the quantity should be apportioned between such accounting divisions on the basis of the number of miles run over each.

Fuel used by locomotives in switching service should be charged to the accounting division for or on account of which the service is performed. At points where such service is performed in common for two or more accounting divisions, the cost of the fuel should be divided between such divisions on the same basis as prescribed elsewhere herein for the apportionment of the wages of enginemen in such switching service.

The cost of handling fuel at each coaling station, including labor, supplies furnished, etc., also the surplus or deficit arising in the operation of such coaling station, should be divided proportionately between the accounting divisions to which fuel was delivered at such station, according to the number of tons delivered account of each.

WATER SUPPLY FOR LOCOMOTIVES.

All expenses of this nature which are wholly on account of one accounting division should be charged in the distribution books to such division.

At those points where water is supplied to locomotives for use on more than one accounting division, the expense should be divided in the distribution books between such divisions on a percentage basis, to be determined, according to the particular circumstances in each case, by the superintendents of the divisions affected, subject to the approval of the general accounting officer.

OIL, TALLOW AND WASTE FOR LOCOMOTIVES.
OTHER SUPPLIES FOR LOCOMOTIVES.

Expenses provided for under these accounts should be reported as "Common to Whole Road." Such charges should be apportioned between the several accounting divisions by the general accounting officer, on the basis of the relative locomotive mileage on each division during the current month.

TRAIN SERVICE.

The time of trainmen should be charged in the distribution books to the accounting divisions over which they run. When a trip extends over more than one accounting division, the time for such trip should be apportioned between the several divisions according to the number of miles run on each.

TRAIN SUPPLIES AND EXPENSES.

The cost of provisions and supplies for snowbound trains or trains delayed by washouts, and similar expenses which belong wholly to a particular accounting division; also the cost of heating trains at stations should be charged in the distribution books to the accounting division on account of which the expense is incurred.

All other charges to this account should be reported as "Common to Whole Road." Such charges should be apportioned between the several accounting divisions by the general accounting officer, on the basis of the relative car mileage (passenger or freight, as the case may be) on each accounting division during the current month.

The expenses of dining and buffet cars, etc., which are operated wholly over a particular accounting division should be charged in the distribution books to such division. When they are operated in common over two or more accounting divisions the expenses on account of same should be divided in the distribution books between the divisions concerned—the basis of apportionment to be determined by the officer in charge of such service, subject to the approval of the general accounting officer.

SWITCHMEN, FLAGMEN AND WATCHMEN.

All expenses provided for under this account which are incurred in connection with the operation of a particular accounting division should be charged in the distribution books to such division.

At junction points where facilities are provided and services rendered in common for two or more accounting divisions, all such common expenses should be divided in the distribution books on a percentage basis between the accounting divisions benefited—the proportions to be determined, according to the particular circumstances in each case, by the superintendents of the divisions affected, subject to the approval of the general accounting officer.

TELEGRAPH EXPENSES.

Expenses of this nature at stations should be charged to the accounting divisions benefited, in the same manner as prescribed elsewhere herein for other station expenses. (See rules under "Switchmen, Flagmen and Watchmen.")

Charges to the above account for expenses at division offices, incurred in common for two or more accounting divisions, but not common to all, should be divided in the distribution books between the divisions benefited, according to the relative services rendered for account of each of such accounting divisions—the proportions to be determined, according to the particular circumstances in each case, by the superintendents of the divisions affected, subject to the approval of the general accounting officer.

Expenses which are common to all the divisions of the road should be reported as "Common to Whole Road." Such charges should be apportioned between the several accounting divisions by the general accounting officer, on the basis of the relative train mileage on each division during the current month.

STATION SERVICE.
STATION SUPPLIES.
SWITCHING CHARGES—BALANCE.

All expenses provided for under the above accounts should be treated as directed under the account "Switchmen, Flagmen and Watchmen."

CAR PER DIEM AND MILEAGE—BALANCE.

Payments for the use of sleeping cars should be charged to the various accounting divisions on the basis of the relative sleeping car mileage on each division during the period for which the payment is made.

Payments and receipts on account of through passenger car arrangements with other roads should be charged or credited to the accounting divisions over which such trains are operated, according to the relative mileage made by such cars over each division.

Miscellaneous payments for use of passenger cars should be charged to the accounting division on account of which the expense is incurred. When common to two or more accounting divisions, but not common to all, the expense should be divided between the accounting divisions affected, on the basis of the mileage made by such equipment over each division.

Receipts and payments for use of passenger cars, which are common to the road as a whole (i. e., that cannot be desig-

nated for particular accounting divisions) should be reported as "Common to Whole Road." Such amounts should be apportioned between the several accounting divisions by the general accounting officer on the basis of the relative passenger car mileage on each division during the current month.

Payments and receipts for use of freight cars should be reported as "Common to Whole Road," and the net charge or credit should be apportioned between the several accounting divisions by the general accounting officer, on the basis of the relative freight car mileage on each division during the current month.

HIRE OF EQUIPMENT—BALANCE.

Charges or credits for the use of switching locomotives at points where the service is performed in common for two or more companies, should be charged or credited in the distribution books to the accounting division for or by which the service is performed.

When such charges or credits are common to two or more accounting divisions the amounts should be divided in the distribution books between the divisions affected, on the same basis as prescribed elsewhere herein for the apportionment of the other items incident to such service. (See rules given under the account "Switchmen, Flagmen and Watchmen.")

Other charges or credits to this account which are on account of a particular accounting division, should be charged or credited in the distribution books to such division. Amounts which are common to all divisions (i. e., that cannot be designated for particular accounting divisions) should be reported as "Common to Whole Road," and should be apportioned between the several accounting divisions by the general accounting officer, on the basis of the relative mileage made by same class of equipment on each accounting division during the current month.

LOSS AND DAMAGE.

Expenses of this nature should be charged to the accounting division responsible for same. In the case of property entrusted to a company for transportation, when the responsibility for the loss or damage cannot be definitely located the charge should be apportioned on a road mileage basis to the various accounting divisions over which the particular shipment was carried. If the expense is common to the road as a whole, the amount should be apportioned between the several accounting divisions by the general accounting officer: in the case of freight, on the basis of the relative number of tons of revenue freight carried one mile on each accounting division

during the current month; and in the case of baggage, on the basis of the relative number of passengers carried one mile on each accounting division during the current month.

Expenses provided for under this heading which are on account of damage to property other than that entrusted to a company for transportation should be treated as directed under the account "Injuries to Persons."

INJURIES TO PERSONS.
CLEARING WRECKS.

Expenses of this nature should be charged to the accounting division responsible for same—such responsibility to be determined by the superintendents of the divisions affected, or, in case of disagreement, by their superior officer. If common to two or more accounting divisions, but not common to all, the expense should be divided between such divisions on a basis to be determined (unless otherwise provided) by the officer under whose authority the payment or charge is made.

Any charges provided for under the above accounts which are common to the road as a whole should be reported as "Common to Whole Road." Such amounts should be apportioned between the several accounting divisions by the general accounting officer, on the basis of the relative train mileage on each division during the current month.

OPERATING MARINE EQUIPMENT.

Expenses of this nature should be charged in the distribution books to the accounting division for which the service is performed. If common to more than one accounting division, the expense should be apportioned in the distribution books between such divisions on a percentage basis—the proportions to be determined, according to the particular circumstances in each case, by the superintendents of the divisions affected, subject to the approval of the general accounting officer.

ADVERTISING.
OUTSIDE AGENCIES.
COMMISSIONS.

All items of expense included in the above accounts which are wholly chargeable to a particular accounting division should be charged in the distribution books to such division.

If common to two or more accounting divisions, but not common to all, the expense should be fairly divided in the distribution books between the accounting divisions affected, according to the services rendered for account of each division —such proportions to be determined, according to the particular circumstances in each case, by the official under whose

authority the expense is incurred, subject to the approval of the general accounting officer.

All expenses provided for under this heading which are common to the road as a whole should be reported as "Common to Whole Road." Such charges should be apportioned between the several accounting divisions by the general accounting officer, as follows: if incurred in connection with freight service, the apportionment should be made on the basis of the relative Freight Earnings of each division during the current month; if a passenger expense, on the relative Passenger Earnings; and if common to freight and passenger service, on the relative Freight and Passenger Earnings of each division during the current month.

STOCKYARDS AND ELEVATORS.

Expenses of this nature should be treated as directed under the account "Switchmen, Flagmen and Watchmen."

RENTS FOR TRACKS, YARDS AND TERMINALS.

RENTS OF BUILDINGS AND OTHER PROPERTY.

Payments for rent of buildings and other property included under these accounts should be charged in the distribution books to the accounting division using such facilities. If used jointly by two or more divisions the rental should be apportioned in the distribution books between such divisions according to the use made of the facilities by each division—the proportions to be determined, according to the particular circumstances in each case, by the superintendents of the divisions affected, subject to the approval of the general accounting officer.

Expenses of this nature which are common to all divisions of the road should be reported as "Common to Whole Road." Such amounts should be apportioned between the several accounting divisions by the general accounting officer, on the basis of the relative gross train ton-mileage on each division during the last preceding twelve months.

STATIONERY AND PRINTING.

All supplies of this nature which are furnished for use on a certain accounting division should be charged in the distribution books to such division.

The cost of supplies used at stations where the facilities are shared in common by two or more accounting divisions should be divided in the distribution books between such divisions on the same basis as prescribed hereinbefore for the apportionment of the other expenses at such common points.

Supplies used in division offices should be charged to the accounting divisions on account of which the supplies are used. If common to two or more accounting divisions, but not common to all, the apportionment should be made on the same basis as used for the apportionment of the salaries and office expenses of division officials. (See rules given under "Superintendence"—Conducting Transportation.)

Expenses provided for under the above account which are common to all divisions of the road should be reported as "Common to Whole Road." Such charges should be apportioned between the various accounting divisions by the general accounting officer, on the basis of the relative gross train ton-mileage on each division during the current month.

OTHER EXPENSES.

Expenses of this nature pertaining wholly to a particular accounting division should be charged in the distribution books to such division.

The basis of apportionment for those expenses which are common to more than one accounting division should be determined, according to the circumstances in each case, by the general accounting officer.

GENERAL EXPENSES.

SALARIES OF GENERAL OFFICERS.
SALARIES OF CLERKS AND ATTENDANTS.
GENERAL OFFICE EXPENSES AND SUPPLIES.

All expenses chargeable to the above accounts should be reported as "Common to Whole Road." Such amounts should be apportioned between the several accounting divisions by the general accounting officer, on the basis of the relative gross train ton-mileage on each division during the current month.

INSURANCE.

Amounts paid for insurance on buildings should be charged to the accounting divisions upon which they are located. When such buildings are used in common by two or more accounting divisions the expense should be divided in the distribution books between the divisions concerned, according to the use made of such facilities by each—the basis of apportionment to be determined by the superintendents of the divisions affected, subject to the approval of the general accounting officer.

The expense of insuring property for the use of the road as a whole, such as general offices, shops, etc., should be reported as "Common to Whole Road." Such charges should be apportioned between the several accounting divisions by the general

accounting officer, on the basis of the relative gross train tonmileage on each division during the last preceding twelve months.

The expense of insuring freight or passengers in course of transportation should be charged to the accounting division over which they are moved. If moved over more than one division the expense should be divided in the distribution books between the divisions concerned, according to the mileage carried on each. If not definitely chargeable to particular divisions, the amount should be reported as "Common to Whole Road," and the apportionment between accounting divisions should be made by the general accounting officer, as directed in the preceding paragraph.

LAW EXPENSES.

All expenses provided for under this account which are occasioned by or consequent upon the operation of a particular accounting division should be charged in the distribution books to such division. When common to two or more accounting divisions, but not common to all, the basis of apportionment (unless otherwise provided) should be determined by the officer under whose authority the expense is incurred.

All expenses chargeable to the above account which are common to the road as a whole should be reported as "Common to Whole Road." Such charges will be apportioned between the several accounting divisions by the general accounting officer, on the basis of the relative gross train tonmileage on each division during the last preceding twelve months.

STATIONERY AND PRINTING (GENERAL OFFICES).

Charges of this nature should be treated as directed for "General Office Expenses and Supplies."

OTHER EXPENSES.

Such expenditures embraced under this heading as are incurred wholly on account of a particular accounting division should be charged in the distribution books to such division. When common to two or more accounting divisions, but not common to all, the basis of apportionment should be determined, according to the circumstances in each case, by the official under whose authority the expense is incurred.

All expenses chargeable to the above account which are common to the road as a whole should be reported as "Common to Whole Road." Such charges should be apportioned between the several accounting divisions by the general accounting officer, on the basis of the relative gross train tonmileage on each division during the current month.

CHAPTER XXXII.

RULES GOVERNING THE APPORTIONMENT OF OPERATING EXPENSES BETWEEN FREIGHT AND PASSENGER.

Although an accurate division of operating expenses as between freight and passenger service cannot be made, yet many companies for their own use keep an approximate account of their expenditures in connection with each class of service, apportioning on certain bases those expenses which are not clearly chargeable to either.

Whenever any facilities are used or services rendered in common for two or more different purposes, an absolute division of the cost on account of each is impossible. For this reason statistics purporting to show the comparative cost of handling freight business or passenger business should not be taken seriously they are only approximations, guesses.*

With this reservation the accompanying rules for the apportionment of operating expenses between freight and passenger are given.

In the division of operating expenses as between "Freight" and "Passenger," these classes of service are definable as follows:

Freight service includes the operation of trains carrying revenue or non-revenue freight, and empty cars for the transportation of freight; also all incidental expenses incurred in connection with the handling of freight business at stations and elsewhere.

Passenger service includes the operation of all trains carrying passengers, baggage, mail, and express, and all expenses incident to the handling of such traffic at stations and elsewhere.

Milk trains should be classed as freight or passenger, according to the disposition made in the accounts of the earnings derived from such trains.

Every item of expense in connection with the operation of mixed trains (i. e., trains made up of both freight cars and passenger cars—each car being devoted wholly or principally

* This subject is treated of more particularly in the volume of the "Science of Railways" series relating to general accounts. Therein the author presents in detail the many obstacles preventing the division of expenses as between the different classes of service.

to the transportation of either freight or passengers), which pertains exclusively to freight business or exclusively to passenger business, should be charged to "Freight" or "Passenger," as the case may be. Expenses in connection with the operation of such trains which are common to both classes of service, as engine expenses and wages of trainmen, for example, should be divided between "Freight" and "Passenger," on the basis of the relative freight and passenger net train ton-mileage of such trains.*

The following rules may be used in apportioning operating expenses between "Freight" and "Passenger":

MAINTENANCE OF WAY AND STRUCTURES.

REPAIRS OF ROADWAY.

RENEWALS OF RAILS.

RENEWALS OF TIES.

REPAIRS AND RENEWALS OF BRIDGES AND CULVERTS.

REPAIRS AND RENEWALS OF FENCES, ROAD CROSSINGS, SIGNS AND CATTLE GUARDS.

REPAIRS AND RENEWALS OF BUILDINGS AND FIXTURES.

REPAIRS AND RENEWALS OF DOCKS AND WHARVES.

In dividing between "Freight" and "Passenger" charges relating to the above accounts, every item pertaining exclusively to freight business or exclusively to passenger business should be charged to "Freight" or "Passenger," as the case may be.

Every item which cannot be considered as exclusively chargeable to either class of service should be reported as "Common to Freight and Passenger." All such charges, unless otherwise provided, should be apportioned between "Freight" and "Passenger" by the general accounting officer, on the basis of the relative freight and passenger gross train ton-mileage on each accounting division during the last preceding twelve months.†

For example, the cost of maintaining freight depots should be charged to "Freight"; passenger depots to "Passenger"; and buildings used jointly in handling both kinds of traffic to "Common to Freight and Passenger." However, in the last named class of buildings, those items of furniture and other

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* Net train ton-mileage is the number of tons hauled one mile—including the tonnage of cars and contents, but excluding tonnage of locomotives and tenders.

† Gross train ton-milage is the number of tons hauled one mile—including the tonnage of locomotives and tenders, cars and contents.

facilities for the accommodation of passengers, also the cost of implements, etc., used in the handling of mail, express, and other business in connection with passenger service, as defined hereinbefore, should be charged to "Passenger"; and, likewise, special provisions for the handling of freight business should be charged to "Freight"—each item of expense being charged as the facts in that particular case warrant, and only those items which are really common to both classes of service being reported as "Common to Freight and Passenger."

The maintenance of yard tracks, spurs to industrial establishments, etc. (including structures in connection therewith), which are used wholly in the handling of freight traffic should be charged to "Freight"; correspondingly, those tracks used wholly in handling passenger equipment should be charged to "Passenger." Sidings used to facilitate the passing of freight and passenger trains will be considered as "Common to Freight and Passenger."

REPAIRS AND RENEWALS OF TELEGRAPH.
STATIONERY AND PRINTING.

Charges against the above accounts should be reported as "Common to Freight and Passenger." Such charges should be apportioned between "Freight" and "Passenger" by the general accounting officer, on the basis of the relative freight and passenger gross train ton-mileage on each accounting division during the last preceding twelve months.

OTHER EXPENSES.

Expenses provided for under the above account should be handled in accordance with the rules given under "Repairs of Roadway."

MAINTENANCE OF EQUIPMENT.

SUPERINTENDENCE.

All charges to this account should be reported as "Common to Freight and Passenger." Such charges should be apportioned between "Freight" and "Passenger" by the general accounting officer, on the basis of the relative charges to each class of service for repairs of locomotives, cars, marine equipment, etc., during the current month.

REPAIRS AND RENEWALS OF LOCOMOTIVES.

Ordinary "running" repairs of each locomotive (amounting ing to, say, less than $75.00 at one time in shop) should be divided in the distribution books between the different classes

of service, on the basis of the relative mileage made by such engine in each class of service during the current month.

The cost of shop repairs of each locomotive (amounting to $75.00 or more at one time in shop) should be divided in the distribution books between the different classes of service, on the basis of the relative mileage made by such engine in each class of service since it last received repairs of the same or heavier class.

Repairs of locomotives in mixed train service should be divided between "Freight" and "Passenger," on the basis of the relative freight and passenger net train ton-mileage of such trains during the last preceding twelve months.

The cost of repairing locomotives in work train service (such amount to be determined by the proportionate mileage made in such service) should be reported as "Common to Freight and Passenger," and the apportionment between "Freight" and "Passenger" should be made by the general accounting officer, on the basis of the relative gross train ton-mileage in each class of service on each accounting division during the last preceding twelve months. (When such work train service is chargeable to "Construction," as in the building of new lines, extensions, etc., the cost of repairing the equipment so used should not be charged to Operating Expenses, but is properly chargeable to the work upon which the work trains are employed.)

Charges to "Repairs of Locomotives—General Account" (i. e., expenses not chargeable to particular locomotives, as cost of repairing snowplows, extra tanks, etc.) should be reported as "Common to Freight and Passenger." The apportionment of such charges between "Freight" and "Passenger" should be made by the general accounting officer, on the basis of the relative freight and passenger locomotive mileage on each accounting division during the last preceding twelve months.

The cost of new locomotives purchased for renewals should be charged to "Freight" or "Passenger," or jointly, according to the service rendered by the locomotives they replace.

REPAIRS AND RENEWALS OF PASSENGER CARS.
REPAIRS AND RENEWALS OF FREIGHT CARS.

Actual.

REPAIRS AND RENEWALS OF WORK CARS.

The expense of repairing work cars should be reported as "Common to Freight and Passenger," and the apportionment between "Freight" and "Passenger" should be made by the general accounting officer, on the basis of the relative freight and passenger gross train ton-mileage on each accounting division during the last preceding twelve months.

REPAIRS AND RENEWALS OF MARINE EQUIPMENT.

Every item of expense provided for under this account which is wholly on account of freight service or wholly on account of passenger service should be charged accordingly.

Charges which are common to freight and passenger service should be so reported in the distribution books. Such charges should be apportioned between "Freight" and "Passenger" by the general accounting officer, on the basis of the relative freight and passenger earnings from the operation of such equipment during the last preceding twelve months.

REPAIRS AND RENEWALS OF SHOP MACHINERY AND TOOLS.
STATIONERY AND PRINTING.
OTHER EXPENSES.

Charges of this nature should be reported as "Common to Freight and Passenger," and the apportionment should be made by the general accounting officer, on the basis of the relative charges to each class of service for repairs of locomotives, cars, marine equipment, etc.; in the case of "Repairs and Renewals of Shop Machinery and Tools" the charges for the last preceding twelve months should be used as the basis; and in the case of the other accounts above the charges for the month in which the expense to be apportioned is incurred.

CONDUCTING TRANSPORTATION.

SUPERINTENDENCE.

All expenses chargeable to this account which are wholly on account of freight service or wholly on account of passenger service should be charged accordingly.

Those items of expense which are common to both classes of service should be reported in the distribution books as "Common to Freight and Passenger." Such charges should be apportioned between "Freight" and "Passenger" by the general accounting officer, on the basis of the relative freight and passenger gross train ton-mileage on each accounting division during the current month.

ENGINE AND ROUNDHOUSE MEN.

The wages of enginemen engaged in hauling freight or passenger trains should be charged in the distribution books to "Freight" or "Passenger," as the case may be.

The wages of enginemen engaged in hauling mixed trains should be divided between "Freight" and "Passenger," on the basis of the relative freight and passenger net train ton-mileage of such trains during the current month.

The wages of engineers and firemen employed in yard switching service should be divided between "Freight" and "Passenger" (each switching point being determined on its merits) on a percentage basis to be determined by the superintendents of the divisions affected, subject to the approval of the general accounting officer. Such percentage should be based on the proportionate amount of work done for account of freight service and passenger service in each particular case.

Charges for wiping locomotives at each roundhouse should be divided in the distribution books between the different classes of service on the basis of the relative number of engines in each class of service wiped at such roundhouse during the current month.

The wages of locomotive boiler washers at each roundhouse should be divided in the distribution books between the different classes of service on the basis of the relative number of engines in each class of service washed out at such roundhouse during the current month.

The wages of all other roundhouse employes provided for under this account should be divided in the distribution books between the different classes of service on the basis of the relative number of arrivals of engines in each class of service during the current month—each roundhouse separately.

Amounts charged to this account for roundhouse expenses incurred in connection with locomotives in yard switching and mixed train service should be divided in the distribution books between "Freight" and "Passenger" on the same basis as prescribed herein for the apportionment of the wages of enginemen in connection with such classes of service.

FUEL FOR LOCOMOTIVES.

Fuel consumed by locomotives in hauling freight or passenger trains should be charged to "Freight" or "Passenger," as the case may be.

Fuel used by locomotives in yard switching and mixed train service should be divided between "Freight" and "Passenger" on the same basis as prescribed elsewhere herein for apportioning other expenses in connection with these classes of service. (See rules given under the account "Engine and Roundhouse men.")

The cost of handling fuel at each fuel station, including the wages of coal heavers, tools and supplies furnished, etc., also the surplus or deficit arising in the operation of such fuel station, should be divided between the different classes of service on the basis of the relative quantities of fuel disbursed account of each class of service at such fuel station during the current month. The proportion of such expenses chargeable to yard

switching and mixed train service, should be further divided between "Freight" and "Passenger," in the same manner as the cost of the fuel used in these classes of service.

WATER SUPPLY FOR LOCOMOTIVES.

The cost of water supply for locomotives should be reported as "Common to Freight and Passenger." Such charges should be apportioned between "Freight" and "Passenger" by the general accounting officer, on the basis of the relative freight and passenger locomotive mileage on each accounting division during the current month.

OIL, TALLOW AND WASTE FOR LOCOMOTIVES.

The cost of supplies of this nature furnished to locomotives in freight service or passenger service should be charged in the distribution books to "Freight" or "Passenger," as the case may be.

The expenses on account of locomotives i yard switching and mixed train service should be divided in the distribution books between "Freight" and "Passenger" in the same manner as hereinbefore specified for apportioning other expenses incurred in connection with such classes of service. (See rules given under the account "Engine and Roundhouse Men.")

OTHER SUPPLIES FOR LOCOMOTIVES.

The cost of tools and supplies furnished to locomotives should be charged in the distribution books to the classes of service in which such locomotives are engaged. To this end those making requisitions for such supplies should be required to specify the class of service chargeable with the articles furnished.

Such expenses on account of locomotives in yard switching and mixed train service should be divided between "Freight" and "Passenger" on the same bases as prescribed elsewhere herein for the apportionment of other expenses on account of such classes of service. (See rules given under the account "Engine and Roundhouse Men.")

Expenses chargeable to this account which are incurred in common for the different classes of service, as the cost of drying sand for use on locomotives, etc., should be reported as "Common to Freight and Passenger." Such charges should be apportioned between "Freight" and "Passenger" by the general accounting officer, on the basis of the relative freight and passenger locomotive mileage on each accounting division during the current month.

TRAIN SERVICE.

The wages of trainmen engaged in running freight or passenger trains should be charged in the distribution books to "Freight" or "Passenger," as the case may be.

The wages of trainmen on mixed trains should be divided in the distribution books between "Freight" and "Passenger," on the basis of the relative freight and passenger net train ton-mileage of such trains during the current month.

TRAIN SUPPLIES AND EXPENSES.

Expenses of this nature which pertain exclusively to freight service or exclusively to passenger service should be charged in the distribution books to "Freight" or "Passenger," as the case may be.

The expenses of mixed trains should so far as possible be charged to the class of service benefited thereby, those items which are common to both being divided between "Freight" and "Passenger" on the same basis as prescribed for the apportionment of the wages of trainmen employed on such trains.

SWITCHMEN, FLAGMEN AND WATCHMEN.

The wages of switchmen engaged exclusively in freight service or exclusively in passenger service should be charged accordingly.

The expense of yard switching at points where the service is performed in common for both classes of service should be divided in the distribution books between "Freight" and "Passenger" (each switching point being determined on its merits) on a percentage basis to be determined by the superintendents of the divisions affected, subject to the approval of the general accounting officer. Such percentages should be based on the proportionate amount of work done for account of freight service and passenger service in each particular case.

The wages of flagmen and watchmen should be treated as directed elsewhere herein for the wages of other station employes. (See rules given under the account "Station Service.")

TELEGRAPH EXPENSES.

Expenses chargeable to this account should be handled in accordance with the rules given under "Superintendence—Conducting Transportation."

STATION SERVICE.

At stations where separate forces are employed for the handling of freight and passenger business, the labor should

be charged in the distribution books to "Freight" or "Passenger," according to the nature of the work performed.

The wages of all station employes whose services are rendered in common for both classes of service should be divided in the distribution books between "Freight" and "Passenger" on a percentage basis to be determined by the division superintendent (each station being determined on its merits). Such percentages should be based on the proportionate amount of time required at each point in handling freight business and passenger business.

STATION SUPPLIES.

Expenses of this nature which are wholly on account of freight service should be charged in the distribution books to "Freight"; and expenses wholly on account of passenger service should be charged to "Passenger."

Those items which cannot be so separated, and which are in fact common to both freight and passenger service, should be reported as "Common to Freight and Passenger," and the apportionment between "Freight" and "Passenger" should be made by the general accounting officer, on the basis of the relative freight and passenger gross train ton-mileage on each division during the current month.

At stations where there are not separate station facilities for each class of business, there will nevertheless be some expenses chargeable to this account which are exclusively on account of only one class of service. In those cases the expense should be charged in the distribution books to the class of service benefited—only those items which are really used in common for both classes of service being reported as "Common to Freight and Passenger."

SWITCHING CHARGES—BALANCE.
CAR PER DIEM AND MILEAGE—BALANCE.

Items of this nature should be charged to "Freight" or "Passenger," according to the class of service on account of which the expense is incurred.

HIRE OF EQUIPMENT—BALANCE.

Charges and credits for use of locomotives in joint switching service at points where such service is performed in common for freight and passenger service should be divided in the distribution books between "Freight" and "Passenger" on the same basis as prescribed for the apportionment of the other expenses of the switching service at such stations.

Payments for use of locomotives in road service should be

charged in the distribution books to "Freight" or "Passenger," according to the class of service in which such engines are used. If used in common in both classes of service the amounts should be so reported and the apportionment between "Freight" and "Passenger" should be made by the general accounting officer, on the basis of the relative freight and passenger locomotive mileage on each accounting division during the current month.

Receipts for the use of a company's road locomotives should be reported as "Common to Freight and Passenger," and the apportionment should be made by the general accounting officer, on the same basis as given in the preceding paragraph.

Payments for the use of wrecking cars and other work or service cars should be charged in the distribution books to the class of service on account of which the expense is incurred. When common to both classes of service such amounts should be so reported in the distribution books, in which case the apportionment between "Freight" and "Passenger" should be made by the general accounting officer, on the basis of the relative freight and passenger gross train ton-mileage on each accounting division during the last preceding twelve months.

Receipts for use of a company's pile-drivers, wrecking cars, etc., should be reported as "Common to Freight and Passenger," and the apportionment between "Freight" and "Passenger" should be made by the general accounting officer, on the basis given in the preceding paragraph.

LOSS AND DAMAGE.
INJURIES TO PERSONS.
CLEARING WRECKS.

The expenses provided for under the above accounts should be charged in the distribution books to the class of service (freight or passenger) causing the outlay—the responsibility to be determined in each instance by the superintendents of the divisions affected.

Charges which are common to both freight and passenger service should be so reported, and the apportionment between "Freight" and "Passenger" should be made by the general accounting officer, on the basis of the relative freight and passenger train mileage on each accounting division during the current month.

OPERATING MARINE EQUIPMENT.

Any expenses of this nature which are incurred wholly on account of freight service or wholly on account of passenger service should be charged accordingly.

Charges which are common to both classes of service should

be reported as "Common to Freight and Passenger." Such charges will be apportioned between "Freight" and "Passenger" by the general accounting officer, on the basis of the relative freight and passenger earnings from the operation of such equipment during the current month.

ADVERTISING.

OUTSIDE AGENCIES.

All items of expense chargeable to the above accounts which are on account of freight traffic should be charged to "Freight"; and those expenses which are incurred in connection with passenger business should be charged to "Passenger."

Expenses which are common to both classes of service (i. e., that cannot be separated as between "Freight" and "Passenger") should be reported as "Common to Freight and Passenger." Such charges should be apportioned between "Freight" and "Passenger" by the general accounting officer, on the basis of the relative freight and passenger earnings of each accounting division during the current month.

COMMISSIONS.

Expenditures of this nature should be charged to "Freight" or "Passenger," according to the nature of the service rendered.

STOCK YARDS AND ELEVATORS.

Charges to this account should be embraced under the heading "Freight."

RENTS FOR TRACKS, YARDS AND TERMINALS.

RENTS OF BUILDINGS AND OTHER PROPERTY.

Charges of this nature which are wholly on account of freight service or passenger service should be charged in the distribution books to "Freight" or "Passenger," as the case may be.

Charges for rent of station and terminal facilities which are used in common for both classes of service should be apportioned in the distribution books between "Freight" and "Passenger," on a percentage basis to be determined by the superintendents of the divisions affected, subject to the approval of the general accounting officer. Such percentages should be based on the relative use made of such facilities in handling freight and passenger business—the percentages in each instance being determined by the circumstances in that particular case.

Amounts paid for rent of buildings used in common for freight and passenger business, other than the station and terminal facilities provided for in the preceding paragraph, should be reported as "Common to Freight and Passenger." Such charges should be apportioned between "Freight" and "Passenger" by the general accounting officer, on the basis of the relative freight and passenger gross train ton-mileage on each accounting division during the last preceding twelve months.

STATIONERY AND PRINTING.
OTHER EXPENSES.

All expenses chargeable to the above accounts which are wholly on account of freight service or wholly on account of passenger service should be charged accordingly.

Charges which are common to both classes of service should be reported as "Common to Freight and Passenger." Such amounts should be apportioned between "Freight" and "Passenger" by the general accounting officer, on the basis of the relative freight and passenger gross train ton-mileage on each accounting division during the current month.

GENERAL EXPENSES.

All expenses chargeable to the accounts coming under this heading which pertain exclusively to freight business or exclusively to passenger business should be charged to "Freight" or "Passenger," as the case may be.

Every item which cannot be considered as directly chargeable to either freight or passenger, and which is in fact common to both classes of service, should be reported as "Common to Freight and Passenger." Such charges should be apportioned between "Freight" and "Passenger" by the general accounting officer, on the basis of the relative freight and passenger gross train ton-mileage on each accounting division during the current month.

CHAPTER XXXIII.

SUMMARY OF RAILWAY DISBURSEMENTS, INCLUDING THE ITEMS CHARGEABLE AGAINST INCOME.

The disbursements of a railway may be classed under two heads—Permanent and Temporary. Permanent expenditures embrace those known as construction; temporary expenditures those we place in the scales against earnings, i. e., expenditures paid for out of earnings. All other disbursements are of a transitory nature merely, i. e., book accounts settled in cash or in kind; they do not come under the head of disbursements in the sense we use the word throughout this book.

A summary of railway disbursements is appropriate in this place and will fitly close the subject. It is as follows:

CONSTRUCTION.—This account is described elsewhere; it properly embraces the original or first cost of property together with all expenditures for additions, enlargements, improvements and other changes along lines of road already in operation which add to the value or first cost of the property; all disbursements, expenses, costs, commissions, salaries and debts incurred in connection therewith or incident thereto; the accruing interest on the amount invested while a property is in course of construction and before it is opened for business; all disbursements and losses suffered in the sale or disposal of bonds, shares, securities or assets, the proceeds of which are used in its purchase or development; all expenditures on account of its rights, franchises and appurtenances. These constitute what is known as construction account.

OPERATING EXPENSES.—The operating expenses are described elsewhere in detail; they embrace the cost of soliciting traffic, handling and transporting freight and passengers, administering the general affairs of a company, and maintaining the property in as good condition as when first built, including the cost of replacing track, structures, equipment, etc., when worn out, with new work of substantially the same quality as the old.

INTEREST ON FUNDED DEBT.—This account embraces the charges for interest on the funded debt of a company. While a property is in course of construction the accruing interest on outstanding bonds should be charged to Construction; but after it has been put in operation outlay of this nature is a

proper charge against income or revenue. Charges of this nature should be made monthly as they accrue, without regard to the date of maturity or payment.

INTEREST ON INTEREST-BEARING CURRENT LIABILITIES, ETC.—This account embraces all payments for interest, exchange or discount on interest-bearing current liabilities (such as bills payable, receiver's certificates, etc.), as well as payments for interest, exchange or discount on current accounts, etc. So far as possible, such items should be charged on the basis of accruals.

INTEREST ON REAL ESTATE MORTGAGES.—This account includes the charges for interest on mortgages on real estate belonging to a company other than that directly required in the operation of the road. Charges of this nature should also be made as they accrue, irrespective of the date of maturity or payment.

RENTS PAID FOR LEASE OF ROAD.—This account is also an offset against income or revenue. It includes the amount of rentals paid for leased lines, whether by payment of interest on guaranteed bonds, by payment of dividends on guaranteed stock, or by cash payment.

TAXES.—To this account should be charged all payments for assessments and taxes levied by the government on real estate, right of way, buildings, equipment and other property, real or personal; also assessments and taxes computed on some arbitrary basis, such as amount of stocks and bonds issued or outstanding; the gross or net earnings, or dividends paid; the number of passengers or amount of freight carried; the length of line operated or owned; the rolling stock; or any other selected quality or fact pertinent to the operation of railway property.

PERMANENT IMPROVEMENTS.—To this account should be charged actual expenditures for permanent improvements made in the current year, for which an appropriation has been made from the current year's income. (The cost of improvements for which no appropriation is made from the income of a company should be charged to "Construction.")

OTHER DEDUCTIONS FROM INCOME.—Separate accounts should be opened under distinctive headings for such items as are properly regarded as fixed charges which may not be assigned to any of the six preceding accounts, including appropriations from or amounts chargeable against the current year's income for sinking funds, reserve or other special funds; losses or deficits of individuals, firms or corporations assumed (not including items properly chargeable to "Rents paid for lease of road"); and other analogous items. Appropriations from the current year's income for future improvement expenditures should be charged under an appropriate heading.

DIVIDENDS ON COMMON STOCK and DIVIDENDS ON PREFERRED STOCK.—These accounts include all dividends declared on the capital stock of a company. The charge should be made when the dividends are declared, without reference to the date of payment.

OTHER PAYMENTS FROM NET INCOME.—A separate account should be kept of such amounts paid as are properly regarded as earnings to the stockholders other than earnings which are reported as dividends.

DEDUCTIONS FOR YEAR.—Separate accounts should be opened under distinctive headings for amounts transferred from the surplus income of preceding years to other accounts, or amounts written off in consequence of adjustments, or payments from income not properly chargeable to the operations of the property during the current year; also appropriations from accumulated surplus for sinking funds, reserve or other special funds; discount on bonds issued for refunding purposes and discount on bonds sold for construction, equipment or improvement purposes (when charged against income); adjustment or cancelation of old asset accounts, as well as losses resulting from sale of investment securities (such as stocks or bonds owned), or other permanent investments; losses or deficits of individuals, firms or corporations assumed, as well as other disbursements (not dividends) applying to business of previous years, and other analogous items.

CHAPTER XXXIV.

PRACTICES OF ENGLISH RAILWAYS IN ACCOUNTING FOR MATERIAL AND LABOR.

For the purpose of account keeping, stores are classified under three heads, viz.: coal, general stores and permanent way stores. Orders for material required are sent to the tradesmen, signed by the general store superintendent; on the back of the orders are printed the conditions on which the material will be accepted. An account is opened with each tradesman from whom goods are purchased. At the end of the month tradesmen's accounts are checked with the invoices and entered into day books or invoice journals and posted therefrom to the debit of the respective stock accounts on the stock ledger. A list of accounts is then made, certified to by the general stores superintendent and submitted to the general stores committee of the board for approval. The accounts and lists are then sent to the accountant of the company for payment.

Goods received at stores are entered into "goods received" books, which are sent to the stores superintendent's office to be compared with the invoices. The stores examiners are not allowed in any case to have access to the invoices, but after the goods have been checked price lists are furnished for the guidance of the superintendent's assistants in pricing out the materials to the consuming departments. Requisitions for stores and stationery for the traffic department are made monthly and countersigned by the general manager. They show the quantity on hand, date and quantity of last supply, and quantity required. The quantities sent out are recorded in detail against each station in order to compare the supplies of one period with another. Requisitions for stores for the locomotive, carriage, and way and works departments are made as the material is needed. They show the quantity and description of each kind of material ordered and the purpose for which it is required.

From the requisitions the stores porters get out the goods and the clerks make out the delivery notes showing the articles, quantity and value, which are copied into an "issue book," but the money portion is torn off before they are sent out. Each consuming department is, however, provided with

a price list. The traffic department is charged with the gross monthly purchases for that department, and not for detailed supplies sent to each station; any variations in stock are adjusted half yearly or yearly. The press copies of the delivery notes for material issued to the locomotive, carriage, and way and works departments are checked every week and the amounts entered into an "issue summary book," a separate book being used for each consuming department. From these books the several stock accounts on the stock ledger are credited. From the issue summary books a statement of stores issued is made each week and forwarded to the accountant. This shows the total value of material issued during the week to each consuming department. On receipt of the goods by the consuming departments the goods are checked with the copies of the requisitions by the stores foreman who has charge of the material, and the delivery notes are receipted and returned to the stores department.

Material cannot be obtained from the stores foreman without a written order signed by the works manager or foreman of the shop. The order states for what purpose the stores are required. From the requisitions and orders weekly statements are made by each consuming department, showing the quantity and value of material chargeable to the several expense accounts. These statements are forwared to the accountant and should agree in total with the weekly statements sent him from the stores department of material issued to each consuming department. The accountant charges the expense accounts with the material used in accordance with the distribution returns furnished him by the several consuming departments.

Coal is sent directly from the colliery to the station where it is to be used. Colliery advices, after being entered by the general stores superintendent, are forwarded to the stations where the coal is sent, to be certified to by the receiving agent. The weights shown are checked and the advices returned to the general stores department. After ascertaining that the amounts are correct, the stores superintendent reports on his statement of issues to the accountant the actual monthly purchase. Coal is weighed out to engines receiving it at stations and the returns thereof are sent to the locomotive superintendent, who sends a statement to the accountant showing the total weight of coal issued each week.

An inventory is taken periodically and compared with the stock ledger, the books being adjusted to the actual by debit or credit entries, as the case may be. The books and inventories of the stores department are checked with the actual stock by the accountant's staff. The administration expenses of the stores department are apportioned to the various consuming departments at the end of each year.

The time of men employed in the way and works department is kept by the gang foremen. They are provided with two time books (one for each alternate week), in which they enter daily the time worked by themselves and the men under them. At the end of the week each foreman sends his book to the inspector of the circuit in which he is located. The inspector makes up his book therefrom. It shows the time, rate and amount due each man, the works on which they were engaged, and the total amount payable at each station in his circuit. He certifies to the correctness of the returns and forwards with the foremen's time books to the district superintendent to be examined, summarized and forwarded to headquarters for the pay bills to be prepared.

The time of men employed at stations is kept by the station clerk or goods agent in charge, who keeps an accurate daily record of the time made by each servant of the company under his control. At the end of the week pay bills are made and sent to headquarters.

The time of engineers and firemen is kept by the locomotive foremen or their clerks, who enter into a day book the number of hours on duty and miles run. The engineers and firemen are required to sign their names in a book and enter the exact time when going on or off duty, stating the due time of train and engine number.

The time of shop men is made up from the workings of their checks. These checks, which bear the men's registered numbers, are deposited in the time office by the workmen on entering, and are returned to them on leaving the premises, morning, noon and night. The time is entered up in the check and time books by the clerks. At the end of the week the time worked by each man is transferred to gate time sheets, which show the rate. These are sent to headquarters. Shop time sheets are filled out by the shop foremen, who enter the time the men are employed on each description of work during the day. These sheets, at the end of the week, are also sent to headquarters. The time, as reported on the shop time sheets, is then compared with the gate time sheets, and the pay bills are made. After the pay bills have been made at the headquarters of the several departments, they are forwarded, with the time books, time sheets and distribution reports, to the accountant.

APPENDIXES.

APPENDIX A.

MATERIAL ACCOUNT—SYSTEM OF ACCOUNTING FOR MATERIAL PURCHASED AND DISBURSED, RECOMMENDED BY THE STANDING COMMITTEE ON DISBURSEMENTS OF THE ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.

"It is believed that the essentials of a correct system will be found in the following general outline:

"The purchasing agent to furnish the storekeeper with all standards and copies of all contracts, agreements and specifications for material to be purchased and to forward him promptly all invoices received. All materials purchased to be placed at once in the custody of the storekeeper, who should inspect the same and certify to the correctness of the invoices as to quantity, quality and price; examine extensions and footings; take up the amounts in his material account; prepare vouchers certifying to the correctness thereof and forward them to the purchasing agent, who will examine prices, certify to their correctness and forward to the manager for approval. After being approved by the manager they should be transmitted to the accounting department, where, if found correct, they should be charged to the storekeeper and approved for payment.

"All material issued by the storekeeper will be upon properly approved requisitions. When material is issued an invoice of the same will be forwarded to the division or department to which it is issued; the division or department, after checking material received against the invoice and finding the same to be correct, will mark the invoice 'correct,' and file until the end of the month; if incorrect in any particular, the question will be taken up at once with the storekeeper for adjustment.

"At the close of each month's business the storekeeper will forward to the divisions and departments a summary of invoices made and charged against them during the month; the amount so charged to be taken up by these divisions and departments in their accounts for the same month. The summaries of invoices forwarded should in all cases be accompanied by legible impression copies of the same, such impression copies to be retained by the divisions or departments against which the invoices are made, the 'originals' to be certified to by the heads of such divisions or departments and sent to the accounting department with their monthly reports or accounts current. The ad-

justment of all differences arising from non receipt of invoices or other causes, and all errors, except errors in footings of summaries, should be made in the succeeding month.

"The same rule will apply throughout between divisions and departments covering material transferred between themselves.

"The storekeepers and heads of divisions or departments will render to the accounting department a monthly report or account current in which shall be shown, under the proper headings, the amount of material (as well as labor) received and disbursed during the month.

"When the annual inventory is completed, the balance of material on hand, as shown by the books of the storekeeper, and those of each division and department should be adjusted to conform thereto, and the discrepancy between these balances and the proper value should be distributed to the expenses of the current year.

"To insure correct accounting for material it is important to have competent foremen to report material used or taken out of track, structures or equipment, as well as competent accountants at storehouses and at division and department headquarters; and where these accountants are not under the immediate direction of the accounting department it is well to have a representative of that department visit the various division headquarters, shops and roadway departments from time to time to see that material is being properly accounted for.

"Prices at which the new material is charged out by the storekeeper to include freight paid to other roads, and may include the salary and expenses of the store department, prorated on the value of materials invoiced each month.

"The prices at which second hand material should be taken up, charged out or invoiced should be fixed from time to time by the purchasing agent.

"Divisions or departments releasing material from the track, structures or equipment of the railway should take the value of the same up at once in their material account, even though the material should be used and charged out again in the same month.

"In the shops of the company labor expended upon material in process of manufacture or upon unfinished equipment should be charged to the material account until the finished article is charged out to 'Repairs,' 'Equipment' or 'Construction.' Provision should be made in the material report blanks for the debit, under proper heads, of all material received and taken from the track, structures or equipment of the road, for credits on account of material transferred to other divisions and departments or sold to individuals and companies, and for credits on account of material used, under the proper general heads, in detail. There should accompany this report a list of vouchers taken into account, and a list of individuals and company bills for which credit has been taken."

APPENDIX B.

RECAPITULATIONS.

For statistical purposes a separate operating or construction account should be opened with each building, bridge, culvert, viaduct, dock, wharf, ferry boat, stock yard, dining car and locomotive for which expense is incurred, but the amount entered in the final recapitulation of expenditures, and carried to the general books, should be the aggregate amount expended under the head of each operating expense or construction account. Therefore, in order to bring together under one heading the amount to be carried to the final recapitulation, and also in order to post readily therefrom to the statistical accounts, a sub-recapitulation of the several operating and construction accounts is required, in the following manner, viz.:

Recapitulation of "Repairs and renewals of buildings and fixtures," or "Station buildings and fixtures," etc.

In making the recapitulation the following should be observed:

1. The recapitulation should specify the building charged in such a manner that its identity can be determined therefrom with certainty.

2. The buildings should be entered in the order of geographical location upon the line.

3. The recapitulation should show the amount charged to each building and the number of the page of the distribution book on which the account may be found.

4. In case credits appear in the recapitulation, the amount to be shown should be the difference between the amount of the debits and the amount of the credits.

Recapitulation of "Repairs and renewals of bridges and culverts" or "Bridges, trestles and culverts."

The recapitulation should commence with the bridge having the lowest number, the others following in numerical order, and in case of "Repairs and renewals of bridges and culverts," closing with the general account. Otherwise the form and purpose of the recapitulation for bridges and culverts are the same as prescribed for buildings.

Recapitulation of "Repairs and Renewals of Locomotives."

The recapitulation should commence with the locomotive having the lowest number, the others following in numerical order, closing with the general account.

The same course will be pursued in the case of docks, wharves, ferry boats and stockyards as is prescribed for buildings.

On the distribution of labor book the accounts named below should be recapitulated and the total amount of the same carried to the final recapitulation at the close of the book under the head of "Manufactured material." The accounts referred to are:

Labor charged to material,

Labor invoiced, and

Articles manufactured by the company.

Final recapitulation of expenditures. (*Labor.*)

A recapitulation of all the accounts in the distribution of labor book should be made at the end of the book. In opening the recapitulation the following information should be given, viz.:

1. The names of the operating expense accounts, in order.

2. The pages of the book on which they are to be found, and lastly, the total amount of labor chargeable; for example: "Repairs and renewals of buildings and fixtures, page 12, $126.30," and so on with the other accounts.

3. The final footing of the recapitulation should agree exactly with the amount of the pay rolls distributed.

4. A summary of pay rolls, showing the amount of each and the total of all pay rolls distributed, should be shown on the page immediately preceding the final recapitulation.

5. No accounts should be entered in the final recapitulation of expenditures except those designated, or those specially authorized by the accounting officer.

6. Bridge and building rebuilding accounts, also addition, enlargement and improvement accounts, should be merged in the operating expense or construction accounts to which they belong, as the case may require, and the combined amount should be carried to the final recapitulation.

7. But one entry should be made in the final recapitulation of expenditures to any one account.

Following the recapitulation, the distribution book should be signed by the storekeeper or official in charge, the signature being attached to the subjoined certificate, viz.: "I hereby certify that the above recapitulation is a correct record of all labor performed."

Recapitulation of material invoice accounts.

A recapitulation of the invoice accounts should be made on the distribution of material book at the end of the month, the same to be arranged in the order in which the accounts are directed to be opened, viz.:

1. Total material received by purchase or from other supply stores and shops separately.

2. Total material forwarded to other supply stores and shops separately.

This recapitulation should be entered immediately before the final recapitulation of expenditures.

Final recapitulation of expenditures. (Material.)

A recapitulation of all the expenditure accounts should be made at the end of the distribution of material book. The accounts should be entered in their order, commencing with the operating and ending with the construction and miscellaneous accounts. The page on which the details of each account may be found should be given in the column provided. The recapitulation should be footed.

In case credits appear in the recapitulation, the amount to be shown should be the difference between the amount of the credits and the amount of the debits.

As a matter of convenience, and to insure accuracy, credits entered in the recapitulation should be made in red ink.

Except as otherwise provided, the form and purpose of this recapitulation are the same as those provided for labor accounts.

Following the final recapitulation, the material distribution book should be certified by the storekeeper or official in charge, the certificate being as follows, viz.: "I hereby certify that the foregoing is a correct distribution of material disbursed and miscellaneous expenses incurred during the month named."

Office of.....*at*..... *Accounting Officer's Folio*.....

Folio of Distribution Book.....

RECAPITULATION OF MATERIAL.

Month of.....19....

(INVOICE ACCOUNTS.)

	FOLIO.	AMOUNT.	
Material Received from			
Material Forwarded to			

Eyelet Eyelet Eyelet

*Office of*_____ *at*_____ *Accounting Officer's Folio*_____

*Folio of Distribution Book*_____

RECAPITULATION OF_____

(EXPENDITURES.)

*Month of*_____ *19*____

	NAME OF ACCOUNT.	FOLIO.	AMOUNT.			
Eyelet.						
Eyelet.						
Eyelet.						

This blank should be used for recapitulating either Material or Labor.

SECTION FOREMAN'S TRACK MATERIAL BOOK.

All material transactions should be entered in the following forms by the Section Foreman, in accordance with the instructions given below, and promptly at the close of the month this book should be completed, certified to by the Section Foreman, and forwarded by first mail to the Roadmaster.

Upon receipt, the Roadmaster will carefully examine the book to see that the entries herein are correct in accordance with his knowledge of the work done. He will then certify to it, and forward it to the Division Superintendent for use in making his material distribution book.

MATERIAL RECEIVED BY SECTION FOREMAN DURING MONTH.

(Form 1)—In this blank should be entered in detail all material received by the Section Foreman during the month (from Purchasing Agent, Storekeepers and others, or taken from track). All entries should be made daily, as the material is received. At the close of the month the total amount of each kind of material received should be carried to the column headed "Received" in the blank intended to cover the use to be made of such material.

MATERIAL FORWARDED BY SECTION FOREMAN DURING MONTH.

(Form 2)—In this blank should be entered in detail all material shipped away by the Section Foreman during the month. All entries should be made daily, as the material is forwarded. At the close of the month the total amount of each kind of material forwarded should be carried to the column headed "Forwarded" in the blank intended to cover the use to be made of such material.

ON HAND LAST REPORT.

On the first day of the month the Section Foreman should enter under this heading in the proper blanks the total amount of each kind of material on hand at the close of the preceding month, as shown by the last report.

RECEIVED.

Under this heading in the proper blanks should be entered the total amount of each kind of material received during the month. This material is entered in detail as received in the blank headed "Material received by section foreman during month."

FORWARDED.

Under this heading in the proper blanks should be entered the total amount of each kind of material shipped away during the month. This material is entered in detail as shipped in the blank headed "Material forwarded by section foreman during month."

USED.

In the proper column under this heading should be entered the total amount of each kind of material used during the month for the purpose designated.

ON HAND LAST DAY OF MONTH.

Under this heading in the proper blanks should be entered the total amount of each kind of material on hand (not in use) at the close of the month—the amount on hand being ascertained by actual inspection. This amount should equal the amount "On hand last report" plus the amount "Received" during the month, after subtracting the amount "Forwarded" and "Used" during the month.

SECTION FOREMAN'S TRACK MATERIAL BOOK—Cont'd

"REPAIRS OF ROADWAY."

(Form 3)—In this blank should be reported transactions pertaining to track material, as per articles specified. All charges to the account "Repairs of Roadway" should be reported in the proper column in this blank. Any articles or kinds of material used for this purpose which are not included in the printed list should be written in the blank lines provided for this purpose.

"RENEWALS OF RAILS."

(Form 4)—In this blank should be reported all transactions pertaining to rails. Any sizes of rails not included in the printed list should be written in the blank lines provided for this purpose. All charges to the account "Renewals of Rails" should be reported in the proper column in this blank.

"RENEWALS OF TIES."

(Form 5)—In this blank should be reported all transactions pertaining to ties. Any sizes or kinds of ties not included in the printed list should be written in the blank lines provided for this purpose. All charges to the account "Renewals of Ties" should be reported in the proper column in this blank.

"REPAIRS AND RENEWALS OF FENCES, ROAD CROSSINGS, SIGNS AND CATTLE GUARDS."

(Form 6)—In this blank should be embraced an account of material, as per articles specified herein, according to the various headings. All charges to the account "Repairs and Renewals of Fences, Road Crossings, Signs and Cattle Guards" should be reported in the proper column in this blank. Any articles or kinds of material used for this purpose which are not included in the printed list should be written in the blank lines provided for this purpose.

MISCELLANEOUS MATERIAL.

(Form 7)—In this blank should be entered all items of material not properly embraced in any of the four preceding blanks. When any of this material is reported used, the particulars should be shown in the blank headed "Material used for other purposes" or "Material used in construction of side-tracks," as the case may be.

MATERIAL USED FOR OTHER PURPOSES.

(Form 8)—In this blank should be entered in detail all material reported "Used for other purposes" in the preceding blanks. In all cases the information given as to the use made of the material should be full and complete. Whenever material is used for repairs of buildings, interlocking plants, bridges and culverts, etc., the location and name or number of such structure should be given.

MATERIAL USED IN CONSTRUCTION OF SIDE-TRACKS.

(Form 9)—In this blank should be reported in detail all material used in the construction, extension or improvement of side-tracks, cross-over tracks, spurs to industries, etc., shown as "Used for construction of side-tracks" in the preceding blanks. A separate column should be used for each track. (Material used in the renewals and repairs of sidings should be charged to the proper "Operating Expense" accounts.)

MATERIAL RECEIVED FROM SIDE-TRACKS TAKEN UP.

(Form 10)—In this blank should be entered in detail all material received in taking up side-tracks, cross-over tracks, spurs to industries, etc., a separate column being used for each track. This material should also be reported in the blank headed "Material received by section foreman during month," and in the other blanks, the same as any other material received during the month.

Form 1.

MATERIAL RECEIVED BY SECTION FOREMAN DURING MONTH.

Section Foremen will enter in detail on this Form all material received (whether from Purchasing Agent, Storekeepers, or taken from track), and at the end of the month enter the items in the Received column on the proper form, as given elsewhere herein.

Date	From whom Received	Where billed from	Car Initials and Numb's	ARTICLES	Quantity		
					New	Usable	Scrap

Form 2.

MATERIAL FORWARDED BY SECTION FOREMAN DURING MONTH.

Section Foremen will enter in detail on this Form all material forwarded, and at the end of the month carry the total of each item to the column Forwarded on the proper form.

Date	To Whom Forwarded	Station Billed To	Car Initials and Numbers	ARTICLES	QUANTITY		
					New	Usable	Scrap

"REPAIRS OF ROADWAY."

FORM 8.

This blank is intended to embrace an account of track material—as per articles specified herein—according to the various headings. All charges for material for "Repairs of Roadway" are to be embraced in this return.

ARTICLES	On Hand Last Report			Received			Forwarded			USED						Balance on Hand		
										Chargeable to "Repairs of Roadway"		For Construction of Side Tracks		Used for Other Purposes				
	New	Usable	Scrap	New	Usable	Scrap	New	Usable	Scrap	New	Usable	New	Usable	New	Usable	New	Usable	Scrap
Angle Bars, 90-lb.																		
" " 80 "																		
" " 72, 65, 60, 56 L. P.																		
" " 72 S. P.																		
" " 65, 60, 56 S. P.																		
" " Compromise.																		
Mall. Step Chairs, 90 to 60 and 65-lb.																		
" " " 80 to 72-lb.																		
" " " 72 to 60 "																		
" " " 60 to 50 "																		
Base Plates, 90-lb.																		
" " 80 "																		
" " 72 "																		
" " Compromise.																		
Bolts, Track, ¾-in.																		
" " ⅞ "																		
Frogs, Spring, 90-lb. R. H., No. 10.																		
" " 90 " L. H., No. 10.																		
" " 80 " R. H., No. 10.																		
" " 80 " L. H., No. 10.																		
" " 72 " R. H., No. 10.																		
" " 72 " L. H., No. 10.																		
" " 60 " R. H., No. 10.																		
" " 60 " L. H., No. 10.																		
" Rigid, 90 " No. 10.																		
" " 90 " No. 8.																		
" " 90 " 9°																		
" " 80 " No. 10																		
" " 80 " No. 8.																		
" " 80 " 9°																		
" " 72 " No. 10																		
" " 72 " No. 8.																		
" " 72 " 9°																		
" " 72 "																		
" " 60 " No. 10.																		
" " 60 " No. 8																		
" " 60 " 9°																		
" " 60 "																		
" " 60 "																		
" Special																		
" Single Slip Centre																		

"REPAIRS OF ROADWAY."

Form 3—Continued

ARTICLES	On Hand Last Report			Received			Forwarded			USED						Balance on Hand		
										Chargeable to "Repairs of Roadway"		For Construction of Side Tracks		Used for Other Purposes				
	New	Usable	Scrap	New	Usable	Scrap	New	Usable	Scrap	New	Usable	New	Usable	New	Usable	New	Usable	Scrap
Frogs, Single Slip End																		
" Double " Centre																		
Frogs, " " End																		
" Crossing, Solid																		
" " Not Solid																		
Frog Bolts																		
" Blocks																		
Guard Rails, 90-lb.																		
" " 80 "																		
" " 72 "																		
" " 60 "																		
" Rail Bolts																		
" " Blocks																		
" " Fillers																		
Rail Braces, 90-lb.																		
" " 80 "																		
" " 72 "																		
" " Others																		
Nut Locks, ¾ in. No.																		
" " ⅞ " No.																		
Plugs, Tie																		
Shims, Track																		
Spikes, Track																		
Springs, Frog																		
Switch Points, 15-ft., 90-lb., R. H.																		
" " 15 " 90 " L. H.																		
" " 15 " 80 " R. H.																		
" " 15 " 80 " L. H.																		
" " 15 " 72 " R. H.																		
" " 15 " 72 " L. H.																		
" " 15 " 63 " R. H.																		
" " 15 " 63 " L. H.																		
" " 15 " 60 " R. H.																		
" " 15 " 60 " L. H.																		
" " ..... R. H.																		
" " ..... R. H.																		
" " ..... L. H.																		
" " ..... L. H.																		
" Rods, No. 1, Adjustable																		
" " No. 1, Common																		
" Tie Rods—Split, Sets 1, 2 and 3																		
" " " Stub																		

ARTICLES	On Hand Last Report			Received			Forwarded			USED						Balance on Hand		
										Chargeable to "Repairs of Roadway"		For Construction of Side Tracks		Used for Other Purposes				
	New	Usable	Scrap	New	Usable	Scrap	New	Usable	Scrap	New	Usable	New	Usable	New	Usable	New	Usable	Scrap
Switch Connecting Rod—Split																		
" Connecting Rod—Stub																		
" Split Slide Plates																		
" " Heel Plates																		
" " Fillers																		
" " Heel Bolts																		
" " Clip Bolts																		
" Stub Chairs, Single																		
" " Double																		
" Slip Points, Straight, R. H.																		
" " " L. H.																		
" " Curved, R. H.																		
" " " L. H.																		
" " Bent Rails, — ft., R. H.																		
" " " — " L. H.																		
" " " — "																		
" " " — "																		
" " Straight Rails —																		
" " Tumbling Rods —																		
" " " " —																		
" " Connecting Rods —																		
" " " " —																		
" " No. 1 Rod, Adjustable																		
" " Bell Crank																		
" " Tumbling Rod Guides																		
" " Levers																		
" " Slide Plates																		
" Stands, Ramapo, No. 1																		
" " " No. 4																		
" " " No. 5																		
" " Rigid High, No. 1																		
" " " Low, No. 2																		
" " High Target																		
" " Mansfield																		
" " Stub, Single Throw																		
" " " Double "																		
" " Jack Knife Single Throw																		
" " " " Double "																		
" Lamps																		
" Lamp Forks																		

TOOLS AND SUPPLIES	On Hand Last Report			Received			Forwarded			USED: Chargeable to "Repairs of Roadway"		USED: For Construction of Side Tracks		USED: Used for Other Purposes		Balance on Hand		
	New	Usable	Scrap	New	Usable	Scrap	New	Usable	Scrap	New	Usable	New	Usable	New	Usable	New	Usable	Scrap
Axes, Chopping																		
" Hand																		
Adzes																		
Augers																		
Anvils																		
Bars, Claw																		
" Crow																		
" Lining																		
" Pinch																		
" Raising																		
" Tamping																		
Benders, Rail																		
Braces, (bit)																		
Bits																		
" drill, ⅞-in																		
" " 1 "																		
Bellows																		
Boards, Spot																		
Boxes, Tool																		
Brooms																		
Brooms, Rattan																		
Burners, Lantern																		
Cans, Hand Car Oil																		
Cans, Oil, 2-gal																		
Chisels, Cold																		
Chisels, Track																		
Dippers																		
Drills, Ratchet																		
Dollies, Rail																		

TOOLS AND SUPPLIES	On Hand Last Report			Received			Forwarded			USED						Balance on Hand		
										Chargeable to "Repairs of Roadway"		For Construction of Side Tracks		Used for Other Purposes				
	New	Usable	Scrap	New	Usable	Scrap	New	Usable	Scrap	New	Usable	New	Usable	New	Usable	New	Usable	Scrap
Flags, Red																		
" Green																		
Files																		
Forks, Pitch																		
" Rail																		
" Stone																		
Gauges																		
Grindstones																		
Hammers																		
" Spike																		
Handles, Axe																		
" Adze																		
" Auger																		
" Hammer																		
" Pick																		
" Sledge																		
" Spike Hammer																		
" Hand Car																		
" Track Jack																		
Hoes																		
" Scuffle																		
Hooks, Brush																		
" Cant																		
Jacks																		
" Track																		
Kegs, Water																		
Levels																		
Lanterns, White																		
" Red																		

TOOLS AND SUPPLIES	On Hand Last Report			Received			Forwarded			USED						Balance on Hand.		
										Chargeable to "Repairs of Roadway"		For Construction of Side Tracks		Used for Other Purposes				
	New	Usable	Scrap	New	Usable	Scrap	New	Usable	Scrap	New	Usable	New	Usable	New	Usable	New	Usable	Scrap
Lanterns, Green																		
Lantern Globes, White																		
" " Red																		
" " Green																		
" Frames																		
" Burners																		
Lines, Tape																		
Mauls, Spike																		
Oil, Car, gals.																		
" Signal, gals.																		
Picks																		
" Tamping																		
Poles, Pike																		
Pails, Water																		
Punches																		
Pullers, Spike, Verona																		
Rakes, Garden																		
Ropes, Switch																		
Stones, Scythe																		
Saws, Crosscut																		
" Hand																		
Sledges																		
Shovels, Track																		
Scoops																		
Scythes																		
Snaths, Scythe																		
Scrapers																		
Tongs, Rail																		
Torpedoes																		
Vises																		
Wheelbarrows																		
Whetstones																		
Wrenches, Track, ¾-in.																		
" " ⅞ "																		
" Frog																		
" Monkey																		
Waste																		
Wicks, Lantern, doz.																		

This blank is intended to embrace an account of track material—as per articles specified herein—according to the various headings. All charges for material for "Renewals of Rails" are to be embraced in this return.

ARTICLES		On hand last Report	Received	Forwarded	USED			Balance on Hand
					Chargeable to "Renewals of Rails"	For Construction of Side Tracks	Used for other purposes	
Steel.....90-lb.	New ..... Ft.							
	Re-rolled..... "							
	Usable (main track) "							
	Usable (side track) . "							
	Scrap ..... "							
Steel.....80-lb.	New ..... "							
	Re-rolled..... "							
	Usable (main track) "							
	Usable (side track) . "							
	Scrap..... "							
Steel.....72-lb.	New ..... "							
	Re-rolled..... "							
	Usable (main track). "							
	Usable (side track) .. "							
	Scrap..... "							
Steel.....66-lb.	New ..... "							
	Re-rolled..... "							
	Usable (main track) "							
	Usable (side track) . "							
	Scrap..... "							
Steel.....60-lb.	New ..... "							
	Re-rolled..... "							
	Usable (main track) "							
	Usable (side track) . "							
	Scrap..... "							
Steel.....lb.	New ..... "							
	Re-rolled..... "							
	Usable (main track). "							
	Usable (side track) .. "							
	Scrap..... "							
Steel.....lb.	New ..... "							
	Re-rolled..... "							
	Usable (main track). "							
	Usable (side track) .. "							
	Scrap..... "							
Iron.....60-lb.	Usable (main track). "							
	Usable (side track) .. "							
	Scrap..... "							
Iron .....lb.	Usable (main track). "							
	Usable (side track)... "							
	Scrap..... "							
Iron.....lb.	Usable (main track). "							
	Usable (side track)... "							
	Scrap..... "							

Form 5.

"RENEWALS OF TIES."

This blank is intended to embrace an account of track material—as per articles specified herein—according to the various headings. All charges for material for "Renewals of Ties" are to be embraced in this return.

ARTICLES	On Hand Last Report		Received		Forwarded		USED						Balance on Hand	
							Chargeable to "Renewals of Ties"		For Construction of Side Tracks		Used For other Purposes			
	New	Usable	New	Usable	New	Usable	New	Usable	New	Usable	New	Usable	New	Usable
Cedar, 6-in														
" 7-in														
" Cull														
Elm, 6-in														
" 7-in														
" Cull														
Hemlock, 6-in														
" 7-in														
" Cull														
Oak, Standard 6-in														
" " 7-in														
" " Cull														
Tamarack, 6-in														
" 7-in														
" Cull														
Switch, 8-ft														
" 9-ft														
" 10-ft														
" 11-ft														
" 12-ft														
" 13-ft														
" 14-ft														
" 15-ft														
" 16-ft														
" 17-ft														
" 18 ft														
" 19-ft														
" 20-ft														
Head Blocks, Elm 12-ft														
" " " 14-ft														
" " Hemlock 12-ft														
" " " 14-ft														
" " Oak 12-ft														
" " " 14-ft														
" " Pine 12-ft														
" " " 14-ft														

"REPAIRS AND RENEWALS OF FENCES, ROAD CROSSINGS, SIGNS AND CATTLE GUARDS." FORM 6.

This blank is intended to embrace an account of material—as per articles specified herein—according to the various headings. All charges for material for "Repairs of Fences, Road Crossings, Signs and Cattle Guards" are to be embraced in this return.

ARTICLES	On Hand Last Report			Received			Forwarded			USED						Balance on Hand		
										Chargeable to "Repairs and Renewals of Fences, Road Crossings, Signs and Cattle Guards."		For Construction of Side Tracks		Used for Other Purposes				
	New	Usable	Scrap	New	Usable	Scrap	New	Usable	Scrap	New	Usable	New	Usable	New	Usable	New	Usable	Scrap
Bolts, Cattle Guard																		
Guards, Cattle (Narrow)																		
Guards, Cattle (Wide)																		
Nails, 10d																		
" 20d																		
" 30d																		
" 40d																		
" 60d																		
Posts, Cedar 7 ft.																		
" " 8 "																		
" " 12 "																		
" " 16 "																		
Pine, 1 x 6 x 16 ft. Pcs.																		
" 2 x 4 x 16 " "																		
" 4 x 4 x 16 " "																		
" 2 x 12 x 16 " "																		
" 3 x 10 x 16 " "																		
" 3 x 12 x 16 " "																		
" 4 x 10 x 16 " "																		
" 4 x 12 x 16 " "																		
Hemlock, 3 x 10 x 16 ft. Pcs.																		
" 4 x 10 x 16 " "																		
Oak, 3 x 10 x 16 ft. Pcs.																		
" 4 x 10 x 16 " "																		
Signs, Crossing and Posts																		
Signs, Truck and Posts																		
Screws, Lag																		
Staples, Fence																		
Spikes, Boat 6-Inch																		
" " 8 "																		
Wire, Barb																		
Wire, Woven Fence																		
TOOLS																		
Augers, Post																		
Brushes, Whitewash																		
Brushes, Paint																		
Diggers, Posthole																		
Draw Knives																		
Pliers and Nippers																		
Wire Stretchers																		
Spades																		

FORM 7.

MISCELLANEOUS MATERIAL.

Material not properly embraced in any of the preceding blanks will be entered herein and when it is used will be reported in the blank headed "Material used for other purposes," or elsewhere as may be proper.

ARTICLES	On Hand Last Report		Received		Forwarded		Used		Balance on Hand	
	New	Usable	New	Usable	New	Usable	New	Usable	New	Usable

FORM 6.

MATERIAL USED FOR OTHER PURPOSES.

There is to be entered in detail on this form all material used except for "Repairs of Roadway," "Renewals of Rails," "Renewals of Ties," "Repairs and Renewals of Fences, Road Crossings, Signs and Cattle Guards," and "Construction of Side Tracks." This form is intended to cover disbursements of material for operating, construction and other accounts not covered by the above named blanks. The name of the account must precede the items in each instance, as say "Repairs Telegraph," and so on. The name of structure should also be given in every case. The material covered by this form is reported as Received on the other blanks.

WHAT USED FOR	DESCRIPTION OF ARTICLES.	Quantity used	
		New	Old

MATERIAL USED IN CONSTRUCTION OF SIDE TRACKS.

FORM 9.

In this blank should be reported in detail all material used in the construction, extension or improvement of side tracks, cross-over tracks, spurs to industries, etc., shown as "Used for construction of side tracks" in the preceding blanks. A separate column should be used for each track. (Material used in the renewals and repairs of sidings should be charged to the proper "Operating Expense" accounts.)

Name of track.											
Location,											
Use to be made of track.											
Length from switch point to switch pt Ft											
Date commenced.											
Date completed.											
Number of order authorizing work.											
ARTICLES USED	Quantity		Quantity		Quantity		Quantity		Quantity	
	New	Usable	New	Usable	New	Usable	New	Usable	New	Usable
Angle Bars, size. No.										
Base Plates, size. No.										
Blocking, No. size. Pcs.										
Bolts, guard rail, No.										
Bolts, split switch heel. No.										
Bolts, track. Lbs.										
Fillers, guard rail, size, No.										
Fillers, split switch size, No.										
Fish Plates, size, No.										
Frogs, spring, No. size, No.										
Frogs, rigid, No. size, No.										
Head Chairs, size, kind No.										
Nut Locks, No.										
Rail Braces, size, No.										
Screws, lag, No.										
Spikes, track, Lbs										
Split Switch Points, size, No.										
Split Switch slide plates, No.										
Split Switch heel plates, No.										
Split Switch connecting rods. No.										
Split Switch tie rods, No. 1, adjust, No										
Split Switch tie rods No. 2, common, No.										
Split Switch tie rods, No. 3, common, No.										
Stub Switch Connecting rods No.										
Stub Switch Tie Rods, No										
Slip Switch Points, No.										
Step Chairs, size, No.										
Switch Stands, kind, No.										
Tie Plates, No.										
Rails, steel -lb. per yd., Ft.										
Rails, Iron -lb. per yd., Ft.										
Ties, track, kind, No.										
Ties, headblocks, size kind, No.										
Ties, switch, size, No.										

MATERIAL RECEIVED FROM SIDE-TRACKS TAKEN UP.

FORM 10.

In this blank should be reported in detail all material received in taking up side-tracks, cross-over tracks, spurs to industries, etc., a separate column being used for each track. This material should also be reported in the blank headed "Material received by section foreman during month," and in the other blanks, the same as any other material received during the month.

Name of track,										
Location,										
Use made of track,										
Length (FROM SWITCH PT. / TO SWITCH PT.) ft.										
Date completed,										
No. of order authorizing work,										
ARTICLES RECEIVED	QUANTITY		QUANTITY		QUANTITY		QUANTITY		QUANTITY	
	USABLE	SCRAP	USABLE	SCRAP	USABLE	SCRAP	USABLE	SCRAP	USABLE	SCRAP
Angle Bars, No.										
Base Plates, "										
Bolts, track, Lbs.										
Fillers, guard rail, No.										
" split switch, "										
Fish Plates, "										
Frogs, spring, "										
" rigid, "										
Head Chairs, "										
Nut-locks, "										
Rail Braces "										
Screws, lag, "										
Spikes, track, Lbs.										
Split Switch Points, No.										
" " slide plates, "										
" " heel plates, "										
" " connecting rods, "										
" " tie rods, "										
Stub Switch connecting rods, "										
" " tie rods, "										
Slip Switch Points, "										
Step Chairs, "										
Switch Stands, "										
Tie Plates, "										
Rails, steel, -lb. per yd., Ft.										
" Iron, " " " " "										
Ties, track, No.										
" headblocks, "										
" switch, "										

DISPOSITION OF SECTION FOREMEN'S ACCOUNTS.

When the foregoing returns of Section Foremen reach headquarters the information they contain that is required for writing up the general books is compiled by the accountants for the whole road, or for different divisions thereof, as may be required.

Thus the material that has been received (through the Purchasing Agent or from other sources) must be shown in detail so that it may be compared with the amount charged by the Purchasing Agent and others, and the whole audited and placed upon the books to the debit and credit of those concerned. For in bookkeeping it must be remembered there can be no debit without a corresponding credit, and *vice versa*.

The scrap that has accumulated must also be taken up and similarly accounted for, so that it may be charged to "Material on Hand" and the proper account or accounts duly credited.

A statement must also be made of material forwarded, and to whom forwarded, so that those to whom it is sent may be properly charged and the sender credited therewith.

Thus the material should all be accounted for and disposed of on the books.

Beside this, the compiler of the Section Foremen's returns must also prepare statements for the general books of the material and labor expended upon operating, construction and other accounts. Thus the amount chargeable to "Repairs of Roadway," "Renewals of Rails," "Renewals of Ties," "Repairs and Renewals of Bridges and Culverts," "Repairs and Renewals of Fences, Road Crossings, Signs and Cattle Guards," "Construction of Side-Tracks," and all other general and specific accounts, must be given separately to be spread upon the records.

The form in which these summarizations of Section Foremen's returns is given varies on different roads, and it is not material what the form is so that the information is full and correct and such as to permit of a proper audit of the accounts and a clear understanding of them by the Accounting Officer.

APPENDIX D.

REQUISITION OF GENERAL STOREKEEPER ON PURCHASING AGENT FOR PURCHASE OF MATERIAL.

FORM 1. A

(Triplicate Form.)

.....19....

To....., Purchasing Agent. No.....

I hereby make requisition for the material specified below, on account of requisition of.....No.....on file in this office. Please send without delay to.....at..... .....and send invoice to..... .....at.....

NOTE.—In the event the material asked for is not granted, or the amount is changed, or the purchase delayed, immediate notice of the fact will be sent to the person making the requisition, so that he may act intelligently. Before forwarding this requisition, an impression copy of same should be taken, to be retained for a record in the office of the maker. (By the use of carbon sheets, this and the two following forms may be filled up at one writing.)

.....

General Storekeeper.

Approved.....

QUANTITY OF MATERIAL			KIND OF MATERIAL	This column to be left blank for use of Purchasing Agent	
Now on Hand	Due on Previous Requisitions	Additional Quantity Wanted		From Whom Ordered	Date

NOTICE OF MATERIAL ORDERED BY GENERAL STOREKEEPER FROM PURCHASING AGENT.

FORM 1. B

(Triplicate Form.) .....19....

.....Purchasing Agent. No.....

The material specified below has been ordered from the Purchasing Agent, on account of requisition of.....No.....on file in this office, to be sent without delay to..... .....at.....and invoice sent to.....at.....

NOTE.—This notice will be sent to the person who is to receive the material, for his information and use in checking the material when received. In case of delay in receipt of material, he should address the Purchasing Agent in regard to it.

.....
General Storekeeper.

QUANTITY OF MATERIAL			KIND OF MATERIAL	MATERIAL RECEIVED			
Now on Hand	Due on Previous Requisitions	Additional Quantity Wanted		Quantity	Date	Car	Invoice Checked

RECORD OF MATERIAL ORDERED BY GENERAL STOREKEEPER FROM PURCHASING AGENT.

FORM 1. O

(Triplicate Form.) ....19....

.... Purchasing Agent. No.....

Record of material ordered from the Purchasing Agent, on account of requisition of.....No.....on file in this office, to be sent without delay to .....at.....and invoice sent to.....at.....

NOTE.—This record should be sent to the person to whom the invoice is to be sent, for his use in checking the invoice. Before accepting an invoice it should be referred to the person to whom the material was sent, to see that the material as invoiced was received in good condition and as ordered.

.....
General Storekeeper.

QUANTITY OF MATERIAL			KIND OF MATERIAL	INVOICE CHECKED		
Now on Hand	Due on Previous Requisitions	Additional Quantity Wanted		NAME OF FIRM	Date of Receipt	Date Checked

FORM 2.
A

PURCHASING AGENT'S ORDER FOR MATERIAL.

.....19....

(Triplicate Form.) ORDER NUMBER.....
(Show the above number on your invoice).

To..... .....

.....

Please forward the material specified below to the ....Railway Co. care of..... at.....

If you cannot deliver the material PROMPTLY notify this office at once.

NOTE.—No cartage paid by this Company. This Company will not be responsible for material delivered to its employes without an order from the General Manager or Purchasing Agent. All communications regarding this order should be addressed to the PURCHASING AGENT.

Invoices in triplicate, on this Company's forms, should be sent to this office on the date the shipment is forwarded. A supply of blanks for this purpose will be furnished upon application. An itemized statement of account should be rendered on the first day of each month, including all invoices for material delivered during the previous month.

Quantity	KIND OF MATERIAL	Price

(The number of this order [given above] must be marked on or tagged to all material shipped).

.....Purchasing Agent.

NOTICE TO CONSIGNEE OF MATERIAL ORDERED BY PURCHASING AGENT.

FORM 2. B

(Triplicate Form.) .....19....

Material has been ordered of ORDER NUMBER.....

.....

.....

To be shipped to the .....

Railway Company, care of.....

at.....

This notice should be compared with your requisition, and the Purchasing Agent promptly notified of any discrepancies.

In case the material is not received promptly, or if any of the material received is defective or not as ordered, please take the matter up with the Purchasing Agent at once, explaining the circumstances in detail.

The number of this order should be given in all correspondence regarding same.

Quantity	KIND OF MATERIAL	Price	

.....Purchasing Agent.

PURCHASING AGENT'S RECORD OF MATERIAL ORDERED.

Form 2 C

(Triplicate Form.)

.....19....

ORDER NUMBER.....

Record of Material ordered from

.....

.....

To be shipped to the.....

.....Railway Co., care of.....

at.....

MEMORANDA CONCERNING THIS ORDER.

.....

.....

.....

.....

.....

Quantity	KIND OF MATERIAL	Price

NOTE.—By the use of carbon sheets these three forms (2-A, B and C) may be filled up at one writing, thus saving clerical labor and insuring accuracy.

.....Purchasing Agent.

FORM 3.

REQUISITION FOR TRANSFER OF MATERIAL AND INVOICE OF MATERIAL TRANSFERRED.

.....19....

..... Requisition No.....

.....

DEAR SIR:—Requisition is hereby made for the Material called for below:

Please send without delay to.....at..... .....

and send the Invoice to .....at.. .....

Certified to.....Date,.....19.... | ..... Date,.....19....
Approved:
Certified to.....Date,.....19.... | ..... Date,.....19....

NOTE:—This blank should be used in ordering material—the quantity "Now on hand," "Due on previous requisitions" and "Additional quantity wanted," and "Kind of material required" being entered in the proper places by the person making the requisition.

Upon receipt of the requisition, properly approved, the official upon whom it is drawn will forward the material in accordance with the directions given above. A record of any items which cannot be supplied at once should be made, such material to be shipped as soon as possible, and the person making the requisition promptly notified of the probable date of shipment.

All items shipped should be invoiced (on this blank) to the proper person, as directed above, showing date and initials and number of car in which shipped, and quantity, price and amount in the spaces provided. Before forwarding the invoice, a tissue copy of it should be taken in a record book by the storekeeper, or official filling the requisition.

The person receiving the invoice should refer it to the person to whom the material was shipped—who should compare it with the record of material received, and in the event of error or omission, or in case there is any variation or deficiency, either in quality or quantity, the account must be corrected accordingly and the person filling up the invoice notified.

Quantity of Material			Kind of Material	Invoice of Material Shipped Date_____ No. Car_____ Initials_____		
Now on hand	Due on previous requisitions.	Additional quantity wanted	In ordering material, please keep within space set apart below	Quantity	Price	Amount

(This is one of three forms, the other two being "Notice of Material ordered" [similar in form to No. 1—B], which is sent to the person who is to receive the material; and "Record of Material ordered" [similar in form to No. 1—C], which is retained by the person making the requisition.)

FOREMAN'S ORDER ON STOREKEEPER FOR MATERIAL REQUIRED FOR IMMEDIATE USE AT SHOPS.

Form 4.

To....., Storekeeper. .....Shop, ...19....

Please deliver to bearer the following articles, viz.:

QUANTITY	DESCRIPTION OF ARTICLE	WEIGHT	PRICE	AMOUNT	

Chargeable to..... .....Foreman.

NOTE.—The "Foreman's record of material ordered from storekeeper for immediate use." in form generally similar to the above, may be filled up simultaneously with the foregoing order, by the use of carbon sheets, and retained in the book as a record.

FORM 5

ORDER ON STOREKEEPER FOR JOURNAL BEARINGS, TOOLS AND MISCELLANEOUS SUPPLIES.

.....19....

To Storekeeper at..... .....

DEAR SIR:—Please deliver to.....

at.....without delay, articles as specified below:

Quantity on hand	Quantity returned *	DESCRIPTION OF ARTICLES	Quantity hereby ordered

PLEASE NOTE THOSE RETURNED, AND ACKNOWLEDGE RECEIPT THEREOF.

Charge to .....

*These articles were returned .....19.... .....Car No..... Signature .....

NOTE.—The "Record of supplies ordered from storekeeper," in form generally similar to the above, may be filled up simultaneously, by the use of carbon sheets, and retained in the book as a record.

DINING CAR CONDUCTOR'S TRIP REPORT.

FORM 6.

Dining Car Conductor's requisition for supplies.

For Car.....

From ....

To..... .....and return

Date..... .....

Approved..... *Supt. Dining Cars.*

Report of supplies on hand from last trip, supplied by storekeeper, purchased during trip, on hand at end of trip, and quantity and value of supplies consumed.

Supplies Required.	ARTICLES.	On hand from last Trip.	Supplied by Storekeeper.	Purchased on Trip.	Total.	On hand at end of Trip.	Consumed on Trip.	
							Quantity.	Value.
	Meats (in detail)							
	Poultry "							
	Game "							
	Fish and Oysters "							
	Fruits "							
	Vegetables "							
	Butter, Milk, etc. "							
	Bread, Flour, etc. "							
	Miscellaneous "							
	Wines and Liquors "							
	Cigars, etc. "							

NOTE.—This blank is so arranged that under the multiplex system the requisition and a portion of the report are written simultaneously, thus saving the clerical work of rewriting, and insuring absolute accuracy and conformity between the different documents.

The above blank and the one on following page are bound together, forming a complete report of the business of each trip.

FORM 6—CONTINUED.

DINING CAR CONDUCTOR'S TRIP REPORT—Continued.

DINING CAR CONDUCTOR'S INVENTORY OF EQUIPMENT.

ARTICLES	On Hand from last Trip	Supplied by store-keeper	On Hand at End of Trip	BROKEN ON TRIP	
				Quantity	Value
Chinaware..(In detail)					
Silverware.. "					
Glassware... "					
Kitchen and Pantry Equipment (In detail)					
Miscellaneous Equipment (In detail).....					

SUMMARY OF TRIP.

SUPPLIES CONSUMED	VALUE
Meats	
Poultry	
Game	
Fish and Oysters	
Fruits	
Vegetables	
Butter, Eggs, etc	
Bread, Flour, etc	
Miscellaneous	
Wines and Liquors	
Cigars, etc	
Breakages	
Total	

RECEIPTS	AMOUNT
For Wines and Liquors	
" Cigars	
.....Meals served a la Carte	
.....Meals served at $.....each	
.....Trainmen served at $.....each	
.....Lunches served	
Total	

REMARKS.

.....

.....

Conductor.

REQUISITION ON SHOP FOREMAN FOR MANUFACTURE OF MATERIAL.

FORM 7. A

Lot No.....

(Quadruplex Form) .....Shops.....19....

The Foreman under..... will, upon approval of this requisition by his superior officer, at once manufacture the following articles for

.....at.....

on account of requisition of .....No.....and notify me, through his superior officer, as soon as completed.

All material and labor expended thereon should be charged to above lot number. Any material charged to this lot number, but not used thereon, also any credits on account of scrap or other material received from same, should be reported to the Storekeeper without delay.

Approved..... .....Storekeeper.

NOTE.—This requisition should be sent directly to the official in charge of the shop for his approval, and for transmission by him to the Foreman. Each Foreman through whose hands this requisition passes should note thereon in the place provided the date received and date completed. As soon as the articles hereby ordered are completed, they should be delivered to the Storekeeper and his receipt taken therefor; notice of such delivery (form 9-A) should be sent to the General Foreman. Upon final completion of the work, the Foreman last in charge of same should return this requisition to his superior officer, who will transmit same at once to the Storekeeper.

Quantity	ARTICLES
... .	....
....	.....
....	.....
.....	.. ..
.....	.....
.....	.....
....	.....
.....	.....
.....	....
... .	.....

FOREMAN'S REPORT OF MATERIAL MANUFACTURED

Number	Date	DISPOSITION
.....	... .	.....
....	.....	....
.....	.....	... .
.....	.....	.....
....	.....	....

RECORD OF SHOP FOREMEN

LOCOMOTIVE DEPARTMENT

Shops	Date Received	Date Completed
Machine ...	... .	....
Boiler.....	.....	....
Blacksmith..	.....	.....
Tank	.....	.....
Tin.....	.....	.....
Paint.....	.....	.....
Foundry..	.....	.....

CAR DEPARTMENT

Shops	Date Received	Date Completed
Planing...	....	.....
Cabinet...	.....	.. ..
Blacksmith.	.....	.....
Passenger	... .	.....
Tin.....	.....	.....
Paint.....	... .	.....
Machine..	.....	.....

GENERAL FOREMAN'S RECORD OF REQUISITION FOR MANUFACTURE OF MATERIAL.

FORM 7. B

Lot No.....

(Quadruplex Form.)

.....Shops.....19....

To.....,.....

A requisition has this day been made on you for the manufacture of the following articles for

.....at.....

on account of requisition of.....No.....

Charge all material and labor expended thereon to above lot number, and notify me when the work is done.

....Storekeeper.

NOTE.—This form should be sent to the official in charge of the shop, for his information and to be retained by him as a record

Quantity	ARTICLES	
.....	.....	Requisition approved and sent to.....
.....	.....	.....19....
.....	.....	
.....	.....	
.....	.....	Work completed and Storekeeper notified.
.....	.....	... .19....
.....	.....	
.....	.....	
.....	.....	Statement of cost examined, approved and returned to Storekeeper.
.....	... .	.....19....
.....	... .	
.....	....	

STOREKEEPER'S RECORD OF REQUISITION FOR MANUFACTURE OF MATERIAL.

FORM 7. C

Lot No.... ..

(Quadruplex Form.)

.....Shops.....19....

A requisition on....., ...
has this day been made for the manufacture of the following articles for.....at.....
on account of requisition of.....No.....

Upon completion of the work the cost thereof should be accurately ascertained, and charge made to the proper accounts. Any apparent discrepancies in cost, as compared with cost of similar articles, should be carefully investigated.

.....Storekeeper.

NOTE.—This form will be used in the Storekeeper's office as a record of the cost and of the disposition made of the charges on account of the articles ordered on above lot number.

Quantity	ARTICLES
.....	....
.....	.. ..
.....	.....
.....	.....
.....	.....
.....	.....
.....	....
. ...	... .
.....	....
.....	.....

RECORD OF COST OF ABOVE MATERIAL	
Material (as per Form 10,	$.....
Labor (as per Form 11),	....
Total	$. .....
Average price.....	$.....each
.....	.....
....	.....

Requisition completed and original returned from shops
..... .19....

MATERIAL INVOICED

To whom	Date	Amount
....	.....	....
....	. .. .	....
.....	.....	....
....	....	....

MATERIAL CHARGED OUT

To what Account	Date	Amount
.....	....	....
.....	.....	....
.....	.....	....
.....	.....	....

STOREHOUSE FOREMAN'S RECORD OF DISPOSITION MADE OF MATERIAL MANUFACTURED AT SHOPS.

FORM 7. D

Lot No.....

(Quadruplex form)

.....Shops.....19....

A requisition on..... .....,.....,

has this day been made for the manufacture of the following articles for.....at .....

on account of requisition of.....No.....

Upon completion, delivery or shipment should forthwith be made as above, unless otherwise ordered. If for any reason shipment is made otherwise than as directed above, the facts should be stated below in the column headed "Remarks," and all persons interested duly notified.

..... Storekeeper.

NOTE.—It is designed that requisitions on shop foremen for manufacture of material should be made by the Storehouse Foreman. This form will be retained in the book, as the Storehouse Foreman's Record.

Quantity	ARTICLES	Storehouse Foreman's Record
		Date the requisition was finally filled
		19

RECORD OF MATERIAL SHIPPED ON ABOVE ORDER

DATE	CAR	MATERIAL	REMARKS

REPORT OF MATERIAL ORDERED ON ANNUAL REQUISITIONS MANUFACTURED DURING MONTH OF .....19....

FORM 8.

NOTE.—At the close of each month the foreman in charge of the work should report hereon the material completed during such month on account of annual requisitions, this report to be used by the storekeeper in computing the average cost of such material for the month named. The report should be made in duplicate, one copy being sent to the storekeeper, and one to the official in charge of the shops.

LOT NO.	QUANTITY	DESCRIPTION OF MATERIAL

Foreman

REPORT TO GENERAL FOREMAN OF MANUFACTURED MATERIAL DELIVERED TO STOREKEEPER.

FORM 9. A

(Duplicate Form.)

.....Shop, ...19...

The following completed material, manufactured on lot number....., has been delivered to Storekeeper to-day:

.....

.....

.....

.....

.....

.....Foreman.

NOTE.—By the use of carbon paper the "Report to general foreman of manufactured material delivered to storekeeper" and the "Receipt for manufactured material delivered to storekeeper" may be filled up at one writing.

SHOP FOREMAN'S RECEIPT FOR MANUFACTURED MATERIAL DELIVERED TO STOREKEEPER.

FORM 9. B

(Duplicate Form.)

.....Shop, ...19....

TO STOREKEEPER:

Please acknowledge receipt of following material, manufactured on lot number ....., delivered to you today:

.....

.....

.....

.....

.....

.....Foreman.

RECEIVED:

.....Storekeeper.

NOTE.—Upon receipt of the above described articles the Storekeeper should sign this receipt and return it to the Shop Foreman, who should then attach it to the "Requisition on Shop Foreman for Manufacture of Material."

STOREKEEPER'S RECORD OF MATERIAL USED IN MANUFACTURE OF MATERIAL AT SHOPS.

FORM 10.

Chargeable to Lot No.....

Description of articles to be manufactured .....

.....

NOTE.—All material used in the manufacture of the articles ordered on above lot number should be entered on this form from day to day as the expenditure occurs, forming the basis finally for determining the cost of the goods when manufactured. Any material charged to the above lot number, but not used thereon, also any credits on account of scrap or other material received from same, should be entered below in red ink and deducted from the total amount charged. In addition to the material used on the above lot number, the amount chargeable for the inspecting, handling, etc., of the material so used should be entered hereon and included as a part of the cost; such amount so added should be credited in the distribution book to the account or accounts to which it was charged in the first place.

Date		Number of Pieces	DESCRIPTION OF MATERIAL	Weight or Quantity	Price	Amount	

STOREKEEPER'S RECORD OF LABOR EXPENDED IN MANUFACTURE OF MATERIAL AT SHOPS.

FORM 11

Chargeable to Lot No.....

Description of articles to be manufactured .....

. .....

NOTE.—All labor expended in the manufacture of the articles ordered on above lot number should be entered on this form from day to day as the expenditure occurs, forming the basis finally for determining the cost of the goods when manufactured. In addition to the labor directly expended on account of the above lot number, the amount chargeable for the proportion of time of foremen, unskilled laborers, etc., on account of same should be entered hereon and included as a part of the cost; such amount so added should be credited in the distribution book to the account or accounts to which it was charged in the first place.

DATE		WORKMAN		No. of Pieces or Hours	RATE	AMOUNT		No. of Machine	REMARKS
		Chk. No.	Occupation						

STOREKEEPER'S REPORT OF COST OF MATERIAL MANUFACTURED AT SHOPS.

FORM 12.

.....Shops.....19....

Description of articles.....

.....

Lot No...., dated.....19.... .....Department

Completed.....19....

MATERIAL				LABOR				
Quantity	Description	Price	Amount	Check No. of Workman	Occupation	No. of Pcs or Hours	Rate	Amount

Total cost, $..... Average price, $.....each

Last preceding average price, date.....19...., $.....each

Present purchase price, $.....each

Examined and approved:	Signed:
.... General Foreman.	..... Storekeeper.

NOTE.—Upon completion of a lot number, the expenditures, as shown on the "Storekeeper's record of material used in manufacture of material at shops" and the "Storekeeper's record of labor expended in manufacture of material at shops," should be summarized on this form, showing the total quantity and cost of each kind of material used, and the total charge for time worked by each employe. This report should be made in duplicate (by the use of carbon sheets), and both copies should be sent to the official in charge of the shops. If upon examination he finds same to be correct, he should approve the original (first copy) and return it to the storekeeper; otherwise the report should be returned for correction. The duplicate should be retained by the general foreman, and attached to the "General foreman's record of requisition for manufacture of material."

Section..... STOCK BOOK. FORM 13.

Record of New, Usable and Scrap Material on hand and ordered at.....Storehouse.

NAMES OF ARTICLES	Classification of Material	June 19		INVENTORY June 30, 19			July 19		Aug. 19		Sept. 19		Oct. 19		Nov. 19		Dec. 19		Jan. 19		Feb. 19		Mar. 19		Apr. 19		May 19		June 19	
		Quan. On Hand	Quan. Ord.	Quan. On Hand	Price	Amount	Quan. On Hand	Quan. Ord.	Quan. On Hand	Quan. Ord.	Quan. On Hand	Quan. Ord.	Quan. On Hand	Quan. Ord.	Quan. On Hand	Quan. Ord.	Quan. On Hand	Quan. Ord.	Quan. On Hand	Quan. Ord.	Quan. On Hand	Quan. Ord.	Quan. On Hand	Quan. Ord.	Quan. On Hand	Quan. Ord.	Quan. On Hand	Quan. Ord.	Quan. On Hand	Quan. Ord.

NOTE.—The above is a page from the "Stock Book." All articles in store should be entered in order, and a record kept of the quantity on hand and ordered each month. This record forms the basis for estimating the ordinary requirements of the service in making the monthly requisitions to replenish stock.

INVOICE OF MATERIAL PURCHASED. FORM 14.

By the..... Railway Company
From.....at.....
For the following supplies sent to.....
At.....
Per Purchasing Agent's Order No.....dated.....19....
Shipped in.....Car No.....From.....
(Car Initials.)
Terms of Sale.....F. O. B.....

Invoice must be mailed to the Purchasing Agent on the same day that the material is shipped. Number and date of order must be given in all cases.

Date of Shipment	Quantity	Kind of Material	Amount

TO STOREKEEPER: Upon receipt of the material this invoice must be dated and signed, and returned to the Purchasing Agent. If any of the material is of inferior quality or deficient in quantity, the facts must be fully and explicitly noted in ink upon the face of the invoice.

Prices examined and extensions checked.

.....

Material received.....19....

.....Storekeeper.

(This is one of three forms, the others being "Storekeeper's record of invoice of material purchased" and "Purchasing agent's record of invoice of material purchased." Under the multiplex system these forms are written simultaneously.

INVOICE OF MATERIAL TRANSFERRED BETWEEN STOREHOUSES. FORM 15.

Forwarded from..... for.....

at..... on account of requisition number.....shipped

in.....car, number.....; chargeable to.....

NOTE.—An invoice is required to accompany or precede all supplies purchased or shipped from any storehouse or other place.

The person to whom the material is consigned must examine it immediately upon its arrival, and in the event of error or omission, or in case there is any variation or deficiency either as regards quality or quantity, the subjoined account must be corrected accordingly. As soon as the articles are received, this invoice must be receipted and returned to the office from whence it came.

DATE OF SHIPMENT		DESCRIPTION OF ARTICLES	QUANTITY	PRICE		AMOUNT	

Received the above this day,

.....19....

.....
Storekeeper.

.....
Storekeeper.

(This is one of three forms, namely: "Invoice of material transferred between storehouses," "Shipping instructions to the agent," "Record of material forwarded." Under the multiplex system these forms are written simultaneously.)

PRICE LIST OF MATERIAL.

FORM 16.

Description of Material	Price from Last Book	1st Line, Year							2nd Line, Year						Index
		Jan.	Feb.	March	April	May	June	Inventory	July	Aug.	Sept.	Oct.	Nov.	Dec.	

NOTE.—The above is a page of the "Price List." The book is indexed and the articles are entered in alphabetical order, thus facilitating ready reference to any particular article. The page gives a complete record of the variation in the prices on each article during two years.

FORM 17.

STOREKEEPER'S STATEMENT OF RAILS ON HAND (not in track) on_____Division,

On the Last Day of_____19——

☞NOTE:—A return similar to this may be made for Ties and other Classes of Material.

RAILS BELONGING TO OPERATING DEPARTMENT.

	No. of Lineal Feet	NUMBER OF TONS OF EACH CLASS OF METAL.									
		90 Lbs. per Yard	80 Lbs. per Yard	72 Lbs. per Yard	65 Lbs. per Yard	60 Lbs. per Yard	56 Lbs. per Yard	— Lbs. per Yard	— Lbs. per Yard	— Lbs. per Yard	Miscellaneous
New Steel Rails.....											
Usable " "											
Scrap " "											
New Iron Rails.....											
Usable " "											
Scrap " "											

RAILS BELONGING TO CONSTRUCTION DEPARTMENT.

	No. of Lineal Feet	NUMBER OF TONS OF EACH CLASS OF METAL.									
		90 Lbs. per Yard	80 Lbs. per Yard	72 Lbs. per Yard	65 Lbs. per Yard	60 Lbs. per Yard	56 Lbs. per Yard	— Lbs. per Yard	— Lbs. per Yard	— Lbs. per Yard	Miscellaneous
New Steel Rails.....											
Usable " "											
New Iron Rails.....											
Usable " "											

This report is made monthly by Division Storekeepers having charge of rails. It should embrace all rails on hand on the last day of the month, including rails at the various mills, or going to or coming from such mills, and belonging to the respective divisions or storehouses. It should also include, as far as possible, rails en route to the various divisions or storehouses on the last day of the month. The Lineal feet of Scrap is not required to be given.

SIGNATURE_____

FORM 18.

SECTION FOREMAN'S REPORT OF STEEL RAILS LAID IN MAIN TRACK.

On the ____ Division During the Month of ____ 19____

NOTE:—This report is made by the Section Foreman as soon as the work is completed.

LOCATION							Single or Double Track. If Double—North, South, East or West Tr'k	Lineal Feet of Track Laid in Main Line	Lineal Feet Rail Laid in Leads
Commencing	North, South, East or West	Of Mile Post	Ending	North, South, East or West	Of Mile Post	Between What Stations			
400 Ft.	West	60	240 Ft.	East	61	Como and Pratt	Single	4640	None

DESCRIPTION OF RAIL LAID				If 2nd-Hand, Where from Give Division and Station, or M. P.	QUANTITY LAID		RAIL TAKEN UP					Remarks
Name of Maker	Year Rolled	Weight per Yard	First or Second Quality New, Rerolled or Usable		Tons	Pounds	Lineal Feet of Track	Name of Maker	Year Rolled	Weight per Yard	Iron or Steel	
USS	1903	90	1st	3d Div. Chicago	124	640	4640	I. S. Co.	1893	72	Steel	

NOTE.—On lines where there are no mile posts, give distances beyond stations in the direction which mileage would increase if posts were set.

____ Section Foreman, Sec. No. ____

Correct ____ Road Master.

FORM 19.

DIVISION STOREKEEPER'S REPORT OF IRON AND STEEL RAILS LAID IN AND TAKEN FROM SIDE TRACKS.

On the.....Division during the month of.....19.....

NOTE—This report is made by the Division Storekeeper from the Section Foreman's report of "Material used in construction of side tracks" and "Material received from side tracks taken up." (See Appendix C.)

LOCATION		Number of Order	Lineal Feet of Track		Description of Rail Laid							Description of Rail Taken Up					REMARKS
Name of Station	Description of Track		Laid	Taken Up	Name of Maker	Year Rolled	Weight per Yard	Iron or Steel	New (1st or 2nd quality) Rerolled or Usable	Quantity		Weight per Yard	Iron or Steel	Usable (for main or side track) or Scrap	Quantity		
										Tons	Pounds				Tons	Pounds	

.....Division Storekeeper.

INSPECTOR'S WEEKLY REPORT OF TIES INSPECTED.

FORM 20.

Report No..... Week Ending .....19....

From whom Received	Location of Ties	NUMBER OF TIES INSPECTED						Station to which check should be sent	REMARKS

.....Inspector.

NOTE.—This report is made weekly by the Inspector. One copy is sent to the Purchasing Agent, one to the Superintendent of the division on which the ties are delivered, and the third is retained for a record by the Inspector.

Under "Number of Ties Inspected," a separate column should be used for each size and kind of ties, the description being entered at the head of the column.

From this report the vouchers are drawn by the Purchasing Agent in payment for the ties accepted. The Purchasing Agent invoices the ties to the Superintendent of the division on which they were delivered, and advises him of the disposition to be made of them. The Superintendent loads and forwards the ties as directed by the Purchasing Agent, and invoices them to the storekeeper to whom they are consigned.

FORM 21

STOREKEEPER'S MONTHLY REPORT OF CAR BRASSES RECEIVED AND ON HAND.

_____ shop, month of _____ 19____

DEBIT.	Patterns of brasses used on passenger cars.	Patterns of brasses used on freight cars.	Total.
Balance on hand last report,			
Received from the general storehouse,			
" "			
" "			
Total number accountable for,			

CREDIT.	Patterns of brasses used on passenger cars.	Patterns of brasses used on freight cars.	Total.
Old brasses sent to the general storehouse to be exchanged for new,			
New brasses on hand by actual count last day of month,			
Old brasses on hand by actual count last day of month,			
Total number accounted for,			

NOTE.—The number of brasses on hand, as well as those received and forwarded during the month, must be cross-footed and entered in Total column. The total number accountable for and the total number accounted for should agree, and any discrepancy should be explained, giving causes, etc. This report should be sent to the General Storekeeper promptly at the close of each month.

SIGNED, _____
Storekeeper.

STOREKEEPER'S MONTHLY REPORT OF SURPLUS MATERIAL ON HAND.

FORM 22.

At..... Date.....19....

.....Storekeeper.

NOTE.—This report is to be made in triplicate, by use of carbon sheets, on the 20th of each month (or oftener when required) by storekeepers and others in charge of material and supplies. One copy should be sent to the General Storekeeper, one copy to the Purchasing Agent, and the third will be retained as a record by the maker. The report must include all new and usable surplus material on hand, whether such material has been previously reported or not. All material should be fully and accurately described. No surplus material will be moved from one division or storehouse to another, nor sent to the general storehouse, except upon orders from the General Storekeeper.

New	Usable	ARTICLES

STOREKEEPER'S MONTHLY REPORT OF SCRAP ON HAND. FORM 23.

at..... .....Storehouse.....19....

Quantity	Kind of Scrap	Quantity	Kind of Scrap
	Angle Bars and Splices.		Pipe, Wrought Iron.
	Ashes, Brass.		Plates, Frog.
	Axles (Car and Engine).		Punchings, Iron.
	Axles (Old Driving).		" " and Steel.
	Bagging, old.		Rags and Upholstery Scrap.
	Barrels, good Kerosene.		Rail Iron Scrap.
	" " Blac Oil.		" Steel " under 3 ft.
	" " Signal Oil.		" " " 5 ft. and under.
	" one headed.		Rail Steel Scrap, 5 ft. and over.
	Boilers, old.		Rail Steel (Frog and Guard).
	Bolts, Nuts and Spikes.		Rope, old.
	Books, old Scrap.		" " Tarred.
	Borings, Cast and Wrought.		" " Wire.
	" Clean Cast Iron.		Rubber Springs.
	Brass, Scrap.		" Hose.
	" Turnings and Borings.		Safes, old.
	Bumpers, Wrought.		Steel, Cast.
	Bumpers, Cast, Wro't and Wood (bolted together).		" " Brake Shoes.
	Copper.		" " Frog Points.
	" Flues, Cleaned.		" Crank Pin.
	Carboys.		" Firebox.
	Drillings, Greasy Wrought.		" " and Boiler.
	Files.		" Light Sheet.
	Flues, Iron.		" Spring Heavy Coil Spiral.
	Glass, broken.		Spring, Light Coil Spiral.
	Hoops, Barrel.		" Spring (Flat).
	Iron, Angle.		" Tires.
	" Boiler.		" Tool.
	" Burnt Wrought.		Splinters and Clippings, Rail, Iron and Steel.
	" Cast.		Stay Bolts, Punchings and Rivets.
	" Cast and Wrought (bolted together).		Tickets, Pasteboard (cut up).
	" Cast, Burnt.		Turnings, Axle.
	" Light Sheet and Steel, mixed.		" Country, mixed.
	" Wrought and Steel mixed.		" Iron, Wrought, clean.
	" Malleable.		" Steel, clean.
	" Tank.		" and Borings, greasy.
	" No. 1 Wrought.		Wire.
	" " 2 "		Wheels, Car and Engine.
	Lead, Sheet and Pipes.		Zinc, Sheet.
	Leather, Scrap, new.		
	Matting, old.		
	Netting, Brass Wire.		
	Paper, old.		
	" " Tissue.		

NOTE.—A report in form similar to the above should be made monthly (or as often as required) by sub-storekeepers to the General Storekeeper, who will in turn summarize it in a report to the Sales Agent and other officials interested. It is a good practice, however, when a carload (or considerable quantity) of any particular kind of scrap has accumulated, to report it to the proper official at once, so that he may make immediate disposition of it if the interests of the company require.

REPORT OF OLD RAIL RECEIVED AT GENERAL STOREHOUSE. FORM 24.

OLD RAILS Received at general storehouse from .....Division,

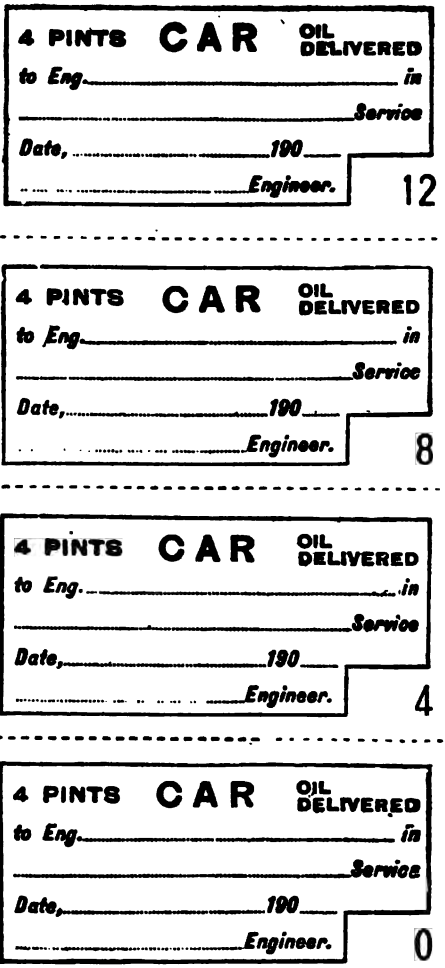
during week ending.....19....

Date of Way-Bill	Initials and Number of Car	Station from which shipped	Lineal ft. of ___ lb. pattern	Lineal ft. of ___ lb. pattern	Lineal ft. of ___ lb. pattern	Lineal ft. of ___ lb. pattern	Lineal ft. of ___ lb. pattern	Net Weight

NOTE.—This form is used by the General Storekeeper in reporting to division storekeepers the weight and pattern of old rails received from them each week. A copy of same should also be sent to the Purchasing Agent, for his information, in order that he may dispose of such material to the best possible advantage.

FORM 25

FORM OF OIL AND WASTE TICKETS USED ON ENGINES.



NOTE.—Engineers are provided with a book containing a supply of tickets of this form for each kind of oil and waste used by them.

Tickets corresponding to the kind and quantity of supplies received are detached from the book by the engineer and given to the storekeeper. The engine number, class of service, and date should be entered on each ticket by the engineer, before it is given to the person delivering the oil or waste.

For convenience in accounting, the tickets for the various kinds of oil and waste are printed on paper of different colors. The tickets are also numbered in order, so that the number on the first unused ticket in the book will designate the quantity used during the month.

AGENT'S DAILY REPORT TO PURCHASING AGENT OF COAL RECEIVED, DISBURSED AND ON HAND AT LOCOMOTIVE COALING STATIONS. FORM 26.

.....Station.

Twenty-four Hours Ending at.....P. M.....19....

Number of Cars Received, ...

Number of Cars Unloaded, ...

Number of Cars on hand to Unload, ...

Number of Tons of Coal Received, ...

Number of Tons of Coal Disbursed, ...

Number of Tons of Coal on hand, viz:

In Cars, ...

In Chutes, ...

In Storage Shed, ...

Piled on Ground, ...

Total, ...

Remarks ....

.....

.....

SIGNED:

.....Agent.

NOTE.—This report should be sent *daily* to the Purchasing Agent, in order that he may arrange the distribution of the coal received from mines according to the needs at each point.

PURCHASING AGENT'S STATEMENT OF COAL ON HAND AT LOCOMOTIVE COALING STATIONS.

FORM 27.

Date.....19....

NOTE.—A statement of this form should be made out (in triplicate) every ten days; one copy should be sent to the General Manager, one to the Superintendent of Motive Power, and the third should be retained by the Purchasing Agent. It affords the information needed in purchasing coal for use on locomotives: the quantity on hand at each coaling station, the average daily consumption, the number of days the stock on hand will last at such rate of consumption, and the storage capacity at each point. It is also used in determining the distribution to be made of fuel as it is received from the mines. It is compiled from the "Agent's daily report to purchasing agent of coal received, disbursed and on hand at locomotive coaling stations."

Name of Coaling Station	Description of Coal House		Number of Cars on hand to unload	Number of Tons in Storage	Total Number of Tons on hand	Average Daily Consumption for Last Ten Days (Tons)	Number of Days Stock on Hand Will Last
	Number of Chutes	Storage Capacity (Tons)					

AGENT'S DAILY REPORT TO PURCHASING AGENT OF COAL RECEIVED FROM MINES AND CONNECTING LINES, AND DISPOSITION MADE THEREOF. FORM 28.

.....Station,.....19....

RECEIVED			FORWARDED			ON HAND Not Yet Disposed of	
From What Station	Number of Cars	Number of Tons	To What Station	Number of Cars	Number of Tons	Number of Cars	Number of Tons

NOTE.—This report should be sent daily to the Purchasing Agent, by all agents receiving locomotive fuel for distribution from mines or connecting lines. It is used by the Purchasing Agent in supervising the disposition made of fuel received and in ascertaining whether or not deliveries are being made by the mines as ordered.

Signed.....Agent.

AGENT'S DAILY REPORT TO GENERAL STOREKEEPER OF COMPANY'S COAL RECEIVED FROM MINES OR CONNECTING LINES. FORM 29.

.....Station.....19....

Name of coal company from which received .....

NOTE.—This blank is to be used by Agents in reporting to the General Storekeeper daily, all Company's coal received from mines or connecting lines. It is used by the General Storekeeper in checking invoices received for coal purchased. Particular care must be taken to give correct car number and weight, and when original way-bill shows that the load has been transferred, the fact must be noted hereon. A separate report should be made for coal received from each different company. The column headed "Invoice Number" should be left blank, for use of the General Storekeeper. This report should be footed and an impression taken of it for a record in the office of the Agent, before forwarding same.

WHERE SHIPPED	WAY-BILL NUMBER	CAR INITIALS	CAR NUMBER	WEIGHT	INVOICE NUMBER

.....Agent.

AGENT'S MONTHLY REPORT TO GENERAL STOREKEEPER OF COAL AND WOOD RECEIVED AND FORWARDED.

FORM 30.

.....Station,.....19....

NOTE.—This report should be forwarded to the General Storekeeper on the 1st day of each month (whenever there is business to report), an impression copy being taken for a record in the office of the Agent. Receipts and shipments should be shown separately.

It should embrace all fuel for company's use received or forwarded during the month at the station named, irrespective of to whom originally consigned, including amounts which are re-shipped or otherwise disposed of. It should not, however, include fuel which is forwarded to other stations on the original billing, nor Blossburg (blacksmith) coal for use at shops.

Fuel originally consigned for commercial use, and through error or otherwise taken for company's use, should be shown on this report. The particulars of the transaction should be stated in full, and a copy of the way-bill on which it was received should be attached hereto.

In the event any company fuel is received without regular way-bill, the receiving agent should at once request billing from the forwarding agent. In case forwarding agent is not known, the receiving agent should notify the Division Superintendent of the facts in the case, and ask that regular billing be furnished. Such fuel should be included in the report for the month in which it is received, estimated weights being used in the absence of way-bills. Correct way-bill weight and date and number of way-bill should follow the report as soon as possible.

DATE		Received from	Shipped to	Car Initials	No. of Car	No. of Waybill	Pounds of Coal	Cords of Wood

No.....

FORM 31.

INSPECTOR'S REPORT OF WOOD MEASURED BY .....

For .... 19.....

No. of Rank	Length	Height	Width	No. Cords Hard	No. Cords Soft	LOCATION			Remarks on Condition, etc.
						Place	Side of Track	Distance from Track	

Hard Woods—Hard Maple, Oak, Hickory, Ironwood, Beech, and Black or Red Birch.
Soft Woods—Soft Maple, Elm, Ash, Walnut, Bass, Tamarack, Hemlock, and White Birch. ....Inspector

NOTE.—This form is used by Inspectors in making a report to the Purchasing Agent of wood measured by them a duplicate should be sent to the General Storekeeper to be used in verifying invoices received for wood purchased.

AGENT'S MONTHLY SUMMARY OF FUEL RECEIVED, FORWARDED, DISBURSED AND ON HAND.

FORM 32

.....Station, for Month ending.....19....

STATION, DR.	Cords of Sawed Wood	Cords of Unsawed Wood	Lbs. of Hard Coal	Lbs. of Soft Coal	STATION, CR.	Cords of Sawed Wood	Cords of Unsawed Wood	Lbs. of Hard Coal	Lbs. of Soft Coal
To Am't on hand per last report,					By Am't taken by locomotives during the month,				
To Am't received by freight trains during the month,					By Am't taken for stove fuel on freight trains,				
To Am't wood purchased during month as per inspector's Report No.....					By Am't taken for stove fuel on passenger trains,				
					By Am't used in passenger and freight houses,				
					By Am't used account water supply,				
					By Am't used in shops and engine houses,				
					By Am't shipped by freight trains,				
					By Am't sold to.....				
					By Am't to pile driver or excavator No..... (specify which),				
Total					By Am't furnished for joint use at.....with.....				
Number of cords of wood sawed during the month to be added to sawed and deducted from unsawed wood,					Total Cr..				
					Balance on hand				
Total. Dr.					Total.				

ONE CUT. TWO CUTS.

Sawed during the month.....cords.....cords.....Station Agent.

NOTE.—This report should be made on the first day of each month, and should embrace all transactions in regard to fuel during the month named. An impression copy of same should be taken for a record in the office of the agent, after which it should be forwarded to the General Storekeeper.

FORM 33

FORM OF COAL TICKETS USED ON ENGINES.

NOTE—When coal is delivered to a locomotive, the engineer is required to give a ticket of this character for each ton received. Tickets should be given in numerical order, and of the class of service in which the engine is engaged.

ONE TON COAL DELIVERED TO PASSENGER LOCOMOTIVE ..... Division 3	ONE TON COAL DELIVERED TO FREIGHT LOCOMOTIVE ..... Division 3	ONE TON COAL DELIVERED TO SWITCHING LOCOMOTIVE ..... Division 3
ONE TON COAL DELIVERED TO PASSENGER LOCOMOTIVE ..... Division 2	ONE TON COAL DELIVERED TO FREIGHT LOCOMOTIVE ..... Division 2	ONE TON COAL DELIVERED TO SWITCHING LOCOMOTIVE ..... Division 2
ONE TON COAL DELIVERED TO PASSENGER LOCOMOTIVE ..... Division 1	ONE TON COAL DELIVERED TO FREIGHT LOCOMOTIVE ..... Division 1	ONE TON COAL DELIVERED TO SWITCHING LOCOMOTIVE ..... Division 1
ONE TON COAL DELIVERED TO PASSENGER LOCOMOTIVE ..... Division 0	ONE TON COAL DELIVERED TO FREIGHT LOCOMOTIVE ..... Division 0	ONE TON COAL DELIVERED TO SWITCHING LOCOMOTIVE ..... Division 0

NOTE—Upon some roads the number of the engine is printed on the ticket, the account being kept directly with the engine.

FORM 34.

AGENT'S MONTHLY REPORT OF FUEL DELIVERED TO LOCOMOTIVES.

Daily record of Fuel delivered to_____Division Locomotives

At_____Station, during the month of_____19_____

NOTE.—**Fuel tickets are provided engineers for use as required. Agents and others in charge of fuel stations** must collect tickets for all fuel delivered to locomotives. When collected they must be put in a box, which must be securely locked. Care must be exercised to see that the tickets received correspond with the fuel delivered. Also that the name of the division to which the engine is assigned is legible. In the event an engineer should refuse or neglect to deliver tickets for fuel received by him, report thereof must be made, forthwith, to the Division Master Mechanic, who will investigate he case and see that tickets are forwarded in accordance with the facts.

A report (of this form) is to be made for each division. The quantities, as per tickets, are to be entered on this report daily. At the close of the month it will be footed and an impression taken of it, after which it will be forwarded to the Storekeeper for the division, as may be directed. The tickets for fuel collected during the month must be arranged according to the order of service, viz: a—Passenger; b—Freight; c—Work, Switching, etc.

The tickets are colored red, white and blue (in the above order), so as to be easily distinguished. Before sending these tickets to headquarters, they must be arranged according to service, viz.: Passenger, Freight, etc.; also according to divisions; the packages for each class of service for each division being tied securely together.

It is the duty of the Agent or Storekeeper in charge of a fuel supply depot to see that those in immediate charge understand their duties and that they observe them. Fuel in store or in transit must be carefully guarded, and in the event of a shortage investigation must at once be set on foot and the proper official notified.

DATE	PASSENGER SERVICE.		FREIGHT SERVICE		WORK AND SWITCHING SERVICE		TOTAL	
	Tons Coal	Cords Wood	Tons Coal	Cords Wood	Tons Coal	Cords Wood	Tons Coal	Cords Wood
1								
2								
3								
4								
5								
6								
7								
8								
and so on to 31								

_____AGENT.

DIVISION STOREKEEPER'S MONTHLY SUMMARY OF FUEL DELIVERED TO LOCOMOTIVES.

FORM 85.

On..... Division during the month of.....19....

NOTE.—This statement is compiled by Storekeepers from the "Agent's monthly report of fuel delivered to locomotives" along the division. A separate statement of this character must be made for each division to which fuel has been delivered. It must be footed and balanced and an impression taken, and sent forward to the official for whom it is intended, on the fifth day after the close of the month.

Before forwarding this statement the Storekeeper must verify it by the tickets actually delivered by engineers.

STATIONS	PASSENGER SERVICE		FREIGHT SERVICE		WORK AND SWITCHING SERVICE		TOTAL	
	Tons Coal	Cords Wood	Tons Coal	Cords Wood	Tons Coal	Cords Wood	Tons Coal	Cords Wood

.....Storekeeper.

FORM 36.

RECORD OF BUSINESS DONE AT _____

Date	Time Arrival & Departure at Yards	Consignor	Consignee	Where from	Where to	Way-Bill Number	Initials and Number of Car	Number of Yard	Feed Way-Bill Number	Number Hogs Live	Number Hogs Dead	Number Cattle Live	Number Cattle Dead

STOCK YARDS, Month of _____ 19__

Number Live Horses	Number Dead Horses	Number Live Sheep	Number Dead Sheep	Dead or Crip pled, Way-Bill Number	SEAL RECORD				AMOUNT OF FEED				Money Collected account of Dead or Crippled Animals and Way-Billed Prepaid	Charges Collected Here	Charges to be Entered on Way-Bill	Remarks
					North	South	East	West	Hay	Corn	Oats	Bed.				

MONTHLY REPORT TO ACCOUNTING DEPARTMENT OF SUPPLIES RECEIVED AND EXPENSES INCURRED AT STOCK YARDS. FORM 37

.....Station.....19..

Date	Name	Description	Quantity	Price	Amount

REVERSE SIDE:

Monthly Statement of Operations of.....
Stock Yards during the month of .....19....

QUANTITY OF FEED ON HAND, RECEIVED AND DISBURSED

	*Hay Pounds	Bedding Pounds	Corn Bushels	Oats Bushels
Quantity on hand first day of month				
Quantity purchased during the month				
Quantity left over from amount fed during month.				
Total				
Quantity disbursed during the month				
Balance on hand last day of month				

VALUE OF FEED ON HAND LAST DAY OF MONTH

DESCRIPTION	Quantity	Price	Value
Hay.....Lbs.			
Bedding.....Lbs.			
Corn .....Bu.			
Oats.....Bu.			
Total			

RECAPITULATION OF OPERATIONS.

Value of feed on hand first day of month		$.....
Add amount purchased during month		$.....
Total		$.....
Less amount used by the Company	$.....	
Less amount on hand last day of month	$.....	$.....
Value of feed sold during month		$.....
Wages of employes at stock yards during month		$.....
Incidental expenses during month, as follows:		
Repairs of stock yards	$.....	
Cost of feed for horses at yard	$.....	
Miscellaneous expenses	$.....	$.....
Total debit		$.....
Receipts for the month, as follows:		
Collections for feed sold	$.....	
Collections for use of scales	$.....	
Miscellaneous collections	$.....	$.....
Profit / Loss for the month		$.....

.....Foreman.

RECORD OF MONEYS COLLECTED AT STOCK YARDS.

Station, 19

DATE.	From whom collected.	AMOUNT.	How disposed of.	Signature of person receiving the money.

FORM 39.

MONTHLY REPORT TO ACCOUNTING DEPARTMENT OF STOCK YARDS CHARGES,

made for feeding stock, and other expenses incurred in connection therewith, at

.....Stock Yards, for the month of.....19.....

DATE	Way-Bill No.	Way-billed to	On whose account.	Car No.	Description of charge.	Quantity.	Price.	Amount collected at the stock yards and way-billed as miscellaneous charges prepaid.		Amount to be collected at destination and way-billed as miscellaneous charges unpaid.	

FORM 40.

GENERAL TIME BOOK; PARTICULARS OF HOURS WORKED BY EACH MAN; RATE OF PAY; WAGES; AND ON WHAT LABOR WAS EXPENDED.

General time book of men employed at_____ in month of_____ 19___

(Left hand page)

DAYS EMPLOYED																													
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

(Right hand page)

HOW EMPLOYED (Account to be charged)	Details of work by hours	Total no. hours worked	RATE	Amount chargeable to each account	Total amount wages	NAME	Employe's check number

TRACK TIME (AND DISTRIBUTION) BOOK.

FORM 41.

Work performed in the Month of _____ 19____

By _____ Occupation _____ Rate _____ per _____

NOTE: This is a leaf from time book of section foreman, and is intended to embrace time and occupation of the workman named above for the month stated.

(Left Hand Page)

DATE	Total Time Worked	MAINTENANCE OF WAY AND STRUCTURES																			UNLOADING FUEL INTO STORAGE	
		"REPAIRS OF ROADWAY"									"Repairs of Interlocking Plants"	"Repairs of Block Signals"	"Repairs and Renewals of Bridges and Culverts"		"Repairs and Renewals of Fences, Road Crossings, Signs and Cattle Guards"	"Repairs and Renewals of Telegraph"	"Laborers at Stations"	"Pilotmen"	"Fuel for Locomotives"	"Clearing Wrecks"	Loading Cinders at Cinder Pits	
		Laying Rails	Laying Ties	General Repairs of Track	Ballasting	Filling Bridges, Trestles and Culverts	Cleaning out Ditches	Clearing Track of Snow and Cutting Weeds	Track Watchmen	Freshet Repairs			General Repairs of Bridges and Culverts	Bridge Watchmen							Coal	Wood
1																						
to 31																						
Total No. of Hours																						
Total Wages																						

(Right Hand Page.)

CONSTRUCTION																		REMARKS
"Track Laying"	"Ballasting"	"Rectifying Grades"	"Changing and Straightening Line"	"Widening Embankments and Cuts"	"Filling Bridges, Trestles and Culverts"	"Ditching"	"Fences"	"Road Crossings and Signs"	"SIDINGS"				"Block and Other Signals"	"Interlocking Switches"				
									Grading	Track Laying	Ballasting							

BRIDGE AND BUILDING TIME (AND DISTRIBUTION) BOOK.

Work performed in the month of _____ *19...*, *by* _____

Occupation _____ *Rate, $* _____ *per* _____

DATE.	Total Time Worked.	LOCATION, NAME AND DESCRIPTION OF OBJECT UPON WHICH WORK IS DONE.	Number or date of order authorizing work.	Repairs of roadway	Repairs of bridges and culverts.	Rebuilding bridges and culverts.	Construction of bridges and culverts.	Repairs of buildings, docks, etc.	Rebuilding buildings, docks, etc.	Construction of buildings, docks, etc.	Repairs of fences, road crossings, signs and cattle guards.	Miscellaneous.	Remarks.	DATE
1														1
2														2
3														3
4														4
5														5
6														6
7														7
8														8
9														9
10														10
11														11
and so on to 31														and so on to 31
		Total number of hours.											Grand total,	
		Total amount of wages. $											$	

TIME BOOK OF LOCOMOTIVE ENGINEERS.

FORM 43.

Page.....

Month of.....19.... .....Engineer.

Number of miles run must be based on distances as shown by Time Table.

NAME OF FIREMAN	DATE	TRAIN NO.	Miscell'g's Time	Switching Time	RUNNING TIME: Way Freight Eng. Class of Engine / Rate of Pay	RUNNING TIME: Frt. and Construct'n Class of Engine / Rate of Pay	RUNNING TIME: Passenger Class of Engine / Rate of Pay	ENGINE NO.	FROM	TO	Miles Run on ..... Div.: Pass.	Freight	Work	Switch	Miles Run on ..... Div.: Pass.	Freight	Work	Switch	Miles Run on ..... Div.: Pass.	Freight	Work	Switch	Delayed Time	Overtime	Constructive Miles	REMARKS
Short in previous month																								
	1																							
	2																							
	3																							
	4																							
	to																							
Total	31				..¢	..¢	¢	¢	¢	..¢	..¢	¢	¢	¢	¢	..¢	..¢	¢	¢	¢	..¢	..¢	¢	¢	¢	

NOTE.—Loose sheets of the form and style of the above should be furnished to all who are required to make returns of engineers' and firemen's time. The object of furnishing the blank in loose sheets instead of in book form is to enable the person who writes it up to take an impression copy before it leaves his hands; thus, the clerical work that would otherwise be required in making a written copy is avoided, the impression answering for local uses while the original copy goes to headquarters. It will be noticed that the sheets are eyeleted; these eyelets are to enable the timekeeper to collect the sheets together and bind them in book form before they leave his hands. The covers for the books are similarly eyeleted. Tape and covers should be furnished with the blanks.

The position of the name of engineer and fireman is reversed on the form for keeping the time of firemen.

Description of Service	No. of Hrs. Allowed	Rate Per Hour	Amount
Road Service,		Cents	
Road Service,		"	
Road Service,		"	
Road Service,		"	
Pusher Service,		"	
Switching,		"	
Dispatching,		"	
Total,		"	

TIME BOOK OF PASSENGER TRAINMEN.

FORM 44.

Month of.....19... .....Conductor.

Date	Train No.	FROM	TO	BRAKEMAN	BRAKEMAN	BAGGAGEMAN	Reg. Pass. Mil.	Ext. Pass. Mil.	Miles to be specified		REMARKS
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
						TOTALS,					

Deduction

Time given Time ticket number

FOR PAY ROLL	Total Time or Mileage	Rate per Month or Mile	Total Wages as Entered on Payroll
Reg. passenger time			
Ext. passenger time			
TOTALS,			

Month of.....19... TIME BOOK OF PASSENGER TRAINMEN. FORM 45.

Occupation							Occupation							Occupation						
Date	Train No.	CONDUCTOR	Rec. Pass. Mil.	Ext. Pass. Mil.	Misc. to be specified		Date	Train No.	CONDUCTOR	Rec. Pass. Mil.	Ext. Pass. Mil.	Misc. to be specified		Date	Train No.	CONDUCTOR	Rec. Pass. Mil.	Ext. Pass. Mil.	Misc. to be specified	
1							1							1						
2							2							2						
3							3							3						
4							4							4						
5							5							5						
27							27							27						
28							28							28						
29							29							29						
30							30							30						
31		TOTALS,					31		TOTALS,					31		TOTALS.				
Deduction							Deduction							Deduction						
Time given		Time ticket number					Time given		Time ticket number					Time given		Time ticket number				
FOR PAY ROLL		Total Time or Mileage	Rate per Month or Mile	Total Wages as Entered on Payroll			FOR PAY ROLL		Total Time or Mileage	Rate per Month or Mile	Total Wages as Entered on Payroll			FOR PAY ROLL		Total Time or Mileage	Rate per Month or Mile	Total Wages as Entered on Payroll		
Reg. passenger time							Reg. passenger time							Reg. passenger time						
Ext. passenger time							Ext. passenger time							Ext. passenger time						
TOTALS,							TOTALS,							TOTALS,						

TIME BOOK OF FREIGHT TRAINMEN.

FORM 46.

Month of..... .....19.... .....Conductor.

Date	Train No.	FROM	TO	BRAKEMAN	BRAKEMAN	Through Freight	Way Freight	Work Train	Pass.	U.S. Yards Time	Switching	Deadhead Time	Overtime	Delayed Time	Constructive Mileage	REMARKS
1																
2																
3																
4																
5																
27																
28																
29																
30																
31																

Deduction_____

Time Given_____ Time Ticket No. _____

FOR PAY ROLL	Total Mileage	Rate per Mile	Total Wages as Entered on Payroll
Through Freight			
Way Freight			
Work Train			
Passenger			
Total			

OPERATING STATISTICS	Total Mileage	Rate per Mile	AMOUNT
Union Stock Yards			
Switching			
Deadhead Time			
Overtime			
Delayed Time			
Constructive Mileage			
Total			

Month of.....19... TIME BOOK OF FREIGHT TRAINMEN. FORM 47.

Brakeman							Brakeman							Brakeman						
Date	Train No.	CONDUCTOR	Through Freight	Way Freight	Work Train	Pass.	Date	Train No.	CONDUCTOR	Through Freight	Way Freight	Work Train	Pass.	Date	Train No.	CONDUCTOR	Through Freight	Way Freight	Work Train	Pass.
1							1							1						
2							2							2						
3							3							3						
4							4							4						
5							5							5						
6							6							6						
27							27							27						
28							28							28						
29							29							29						
30							30							30						
31		TOTALS,					31		TOTALS,					31		TOTALS,				
Deduction							Deduction							Deduction						
Time given		Time ticket number					Time given		Time ticket number					Time given		Time ticket number				

FOR PAY ROLL	Total Mileage	Rate per Mile	Total Wages as Entered on Payroll		FOR PAY ROLL	Total Mileage	Rate per Mile	Total Wages as Entered on Payroll		FOR PAY ROLL	Total Mileage	Rate per Mile	Total Wages as Entered on Payroll	
Through Freight					Through Freight					Through Freight				
Way Freight					Way Freight					Way Freight				
Work Train					Work Train					Work Train				
Passenger					Passenger					Passenger				
TOTALS,					TOTALS,					TOTALS,				

LIST OF EMPLOYES NOT PRESENT AT COMMENCEMENT OF WORK. FORM 48.

Shop, *19*

The following employes were not present this

Check Number.	Check Number.	Check Number.

Checking Clerk.

NOTE.—This statement should be given to the timekeeper, who should record the fact of the employe's absence in the proper place opposite his name in the time book.

CERTIFICATE OF TIME AT WHICH AN EMPLOYE COMMENCES WORK.

FORM 49.

(STUB.)	
.....19....	.....Shop, ...19....
.....	.....Occupation.....
Occupation	Commenced work this day at.....M.
Commenced work this date,	
at ..... M.	.....Foreman.

NOTE.—This form is used by Shop Foremen in certifying to the timekeeper the hour at which an employe commences work, who failed to report at checking time. It is delivered by the employe to the timekeeper when checking out.

CERTIFICATE OF TIME AT WHICH AN EMPLOYE LEAVES WORK.

FORM 50.

(STUB.)	
.....19....	..... Storekeeper. .....Shops.....
.....	.....Occupation.....
Occupation	Quit work this day at.....M.
Quit work this day at.....	Please allow him.....hours.
....M.	.....Foreman.
Allowed .....hours.	

NOTE.—Whenever an employe leaves work before the usual closing hour, this form is used by the Shop Foreman in reporting to the timekeeper the hour at which he left.

(STUB.)

REPORT OF OVERTIME.

.....19....

Names	Time Worked		Employed on
	From	To	

FOREMAN'S REPORT OF OVERTIME WORKED BY SHOP EMPLOYES. FORM 51.

.....Shop. .....19....

Names	Check No.	Occupation	Time Worked		Time Allowed	Employed on
			From	To		

....Foreman.

Approved ....

(NOTE.—Report of time worked by operatives at other than regular hours or in absence of Timekeeper, to be certified to Storekeeper.)

FORM 82

EMPLOYE'S DAILY REPORT OF DISTRIBUTION OF SHOP LABOR.

(Motive Power Department.)

DATE.....19.....

Check No..... Name.....

NOTE.—This form is to be filled out by the employe each day, giving a detailed account of the work performed by him.

It should then be approved by the foreman and forwarded by him to the timekeeper for entry in the general time book.

Hours Worked	Engine or Other Account Worked On	REMARKS

EXAMINED

FOREMAN

FORM 86

EMPLOYE'S DAILY REPORT OF DISTRIBUTION OF SHOP LABOR.

(Car Department.)

Date..... 19.....

Check No..... Name.....

PASSENGER CARS	Freight cars	Work cars	Tools and machinery	Building repairs	Piece work	Miscellaneous (to be specified)	Total

Remarks _____

Examined _____

Foreman _____

NOTE—This report must be made daily by each employe when not otherwise provided for, and must show the number of hours engaged on each kind of work. After being approved by the foreman it is sent to the time-keeper to make the proper allowance of time. The report is further used in making the necessary charges on the distribution books against the accounts on which the labor was expended.

FORM 54

FOREMAN'S REPORT OF PIECE WORK PERFORMED BY EACH EMPLOYE.

Check No.....

Shop..... .....Shop,.....19.....

To.....

Please allow.....

occupation.....nature of work..... .....

.....

number of pieces.....rate per.....

.....

time engaged in above work from.....to.....

.....

Charge to.....

Approved:..... .....
Foreman.

NOTE—This report is to be made by the foreman for each employe engaged on piece work. After being approved by the official in charge the report is sent to the time-keeper and accounting clerk to make the proper allowance of time and such other entries as are necessary. A carbon sheet should be used and the copy retained by the foreman for his record. This blank may be printed on colored paper, to designate it readily from other classes of labor.

LOCOMOTIVE ENGINEER'S TRIP REPORT OF TIME WORKED.

Month of.....19....

NOTE.—At the close of each day's service or trip, engineers will make a detailed report on this form and forward it to the roundhouse foreman, who will examine same and forward it to the timekeeper.

Mileage made with light engines should be indicated by the letter "L"; with dead engine, hauled in train, by letter "D."

ENGINE NO.	TRAIN NO.	TIME CALLED FOR	DEPARTED		ARRIVED		MILES RUN AS PER TIME TABLE				HOURS WORKED IN ADDITION TO MILES RUN (Particulars must be given on back of this Report)				NAME OF FIREMAN
			Time	From	At	Time	Pass.	Frt.	Gravel	W. Frt.	Work Train	Switching	Over Time	Delayed Time	
		.....	.....Day			.....Day									
		M	M			M									
		.....	.....Day			.....Day									
		M	M			M									
		.....	.....Day			.....Day									
		M	M			M									
		.....	.....Day			.....Day									
		M	M			M									

.....Engineer

(NOTE.—This is one of two forms, namely: Locomotive Engineer's trip report of time worked and Locomotive Engineer's daily record of time worked. Under the multiplex system of accounts these forms are written simultaneously. On the back of above forms provision is made for entering particulars of hours worked.)

FORM 56

LOCOMOTIVE ENGINEER'S REPORT OF TIME EMPLOYED IN YARD SWITCHING.

NOTE.—When an engine crew is engaged in switching, a report of this character must be made by the engineer at the close of the day's service and forwarded to the agent (or person in charge at the point where the work was performed), who, after approving same, will forward it to the timekeeper. If time is taken for meal, one hour should be deducted in allowing the time as shown by this report.

No. of Hours.....Engine No. { ..... / ..... }

Switching at.....

From.....o'clock.....M. To.....o'clock.....M.

Date.....19.....

....

Engineer. *Fireman.*

REMARKS.

Did you work noon hour?

FORM 57

ENGINEHOUSE REGISTER.

.....Enginehouse,.....19.....

DEPARTURES. (OR ARRIVALS.)

Number of Train	Number of Engine	Kind of Train	Destination	Engineer	Fireman	Time of Departures

NOTE—The page opposite this in the register is the same form as the above, and is used for "*Arrivals.*" This book is useful for reference in keeping the switching time of engineers and firemen.

FORM 56

TRAIN DISPATCHER'S DAILY REPORT OF TRAIN MOVEMENTS.

.....DIVISION.

Date..... 19....

NOTE.—The train dispatcher will enter hereon a record, daily, of train movements on his division and forward a copy to the engineers' and firemen's timekeeper. Entries for continuous trips should be made in succession.

Direction	Train No.	Engine No.	Engineers	Conductors	DEPARTING			ARRIVING		Actual Mileage	Hours on Duty	TONNAGE		Class Service	Remarks
					Terminal	Time Ordered	Time Left	Terminal	Time			Capacity Engine	Hauled by Engine		

.....

Chief Train Dispatcher.

FORM 59

YARDMASTER'S DAILY REPORT OF TIME WORKED BY SWITCH YARD CREWS.

At_____for 24 hours ending_____o'clock ____M._____ 19____

Signed_____

NOTE.—This report is to be made in triplicate (by the use of carbon sheets) by the agent, yard master or other person in charge of the station or yard where switching crews are engaged

A copy should be sent daily to the Division Superintendent and Storekeeper, and a copy retained as a record by the maker.

TIME WORKED BY ENGINEMEN.

Engine No.	Name of Engineer	Name of Fireman	Time Commenced Work	Time Quit Work	Time Taken for Meals	Total Hours Worked

TIME WORKED BY TRAINMEN.

Engine No.	Name of Foreman	Name of Helpers	Time Commenced Work	Time Quit Work	Time Taken for Meals	Total Hours Worked

FORM 60

ENGINEMEN'S MONTHLY REPORT OF TIME WORKED.

Name_____ Occupation_____

For the month of_____19____ _____Division.

NOTE.—This report is made by each engineer and forwarded to the time-keeper not later than the second day after the close of the month.

Miscellaneous time is intended to include time attending law suits inquests, dispatching, watching and trying engines, or other time not actually on road or engaged in switching services.

Delayed and overtime should be entered with running time.

NAME OF FIREMAN OR ENGINEER (as case may be).	Date	Engine Number	From	To	Miscellaneous Time	Switching Time	RUNNING TIME			
							Way-Frt. Eng.		Other Engines	
							Stand.	Large	Stand.	Large
	1									
	2									
	3									
	4									
	5									
	6									
	7									
	8									
	9									
	10									
	11									
	12									
	13									
	14									
	15									
	16									
	17									
	18									
	19									
	20									
	21									
	22									
	23									
	24									
	25									
	26									
	27									
	28									
	29									
	30									
	31									
TOTALS.										

Send Pay Check to_____

PASSENGER CONDUCTOR'S TRIP REPORT. FORM 61.

Train No..... GOING,..... .....

Left.....at.....M. .....19....

Arrived at.....at.....M. .....19....

ENGINE NUMBER	NAME OF ENGINEER	TONS COAL USED

	Initials	Car Nos.	Taken at	Left at	Miles	Weight	1000 Ton Miles
Postal Cars, 40 Tons.							
Baggage and Exp. Cars, 35 T.							
Passenger Cars, 30 Tons.							
Sleeping Cars, 60 Tons.							
Dining and Buffet Cars, 65 T.							
Parlor Cars, 35 Tons.							

	Miles Run.	Rate per Mo.
Brakemen.....	.....	....
....	.....	....
....	.....	.....
Baggageman.....	....	....
Conductor.....	.....	....

FREIGHT CONDUCTOR'S TRIP REPORT.

FORM 62.

*Train No.*_____ *Date*_____ *19*____

*Ordered to leave at*_____*M. Left*_____*at*_____*M. Arrived at*_____*Station at*_____*M.*

*Conductor*_____ *Brakemen*_____

	CLAIMED.		ALLOWED	
	Through	Way-Freight	Through	Way-Freight
Scheduled Mileage				
Overtime				
Delayed Time				
Switching at Terminals				
Total Mileage for Day's Work				

*Miles run*_____

REMARKS.

The numbers and initials of cars must be taken from the cars and not from way-bills.

	INITIALS	CAR NUMBERS		OFFICE CHECK COLUMN	BILLED FROM	BILLED TO	WHERE TAKEN	WHERE LEFT	CONTENTS	CAR MILEAGE	Weight of car & contents in tons	This column is not to be filled out by conductor	
		Loaded	Empty									TON	MILES.
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													

TRAINMEN'S MONTHLY REPORT OF MILES RUN.

FORM 63.

Month of.....19....

Name..... Occupation.....

NOTE.—This report should be made by all trainmen and forwarded to the timekeeper not later than the second day after the close of the month.

In the "other trainmen" column, conductors will enter names of brakemen and baggagemen; brakemen and baggagemen will enter name of conductor.

Date	Train No.	OTHER TRAINMEN	FROM	TO	MILES RUN ON				Total Day's Mileage	REMARKS
					Passenger	Through Freight	Way Freight	Gravel		
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31										
				TOTAL,						

FORM 64.

CONDUCTOR'S REPORT OF WORK TRAINS.

NOTE—This form is to be used by Conductors of Work Trains, and they will state fully under the heading "Nature of Work Performed," the kind of work and for what purpose, so that the proper account can be charged with the cost and other particulars known to those concerned.

.....Station,.....19....

Miles run.....

Hours worked.....

Conductor.....hours at.....amount.....

Brakeman..... " " ..... " .....

Engineer..... " " ..... " .....

Fireman..... " " ..... " .....

Watchman..... " " ..... " .....

Labor coaling engines..... " .....

Coal.....tons at..... " .....

Oil.....pints at..... " .....

Oil..... " " ..... " .....

..... " .....

Total.....

Nature of work performed.....

.....

.....

No. cars.....hauled.....

" " .....unloaded between.....

....

Average cost per car.....

.....Conductor.

STATEMENT OF DEDUCTIONS TO BE MADE FROM PAY OF EMPLOYES ON ACCOUNT OF BOARD. FORM 65.

.....Station.....19....

To.....

.....

The following amounts should be deducted from the wages of the persons named below for the month of.....19.....

NOTE.—The Company will not undertake to collect from its employes any board bills, unless the employe consents that such amounts be retained by the Company from his wages.

The person who keeps the time of those against whom board is to be deducted must certify to the correctness of the amount, and no board bill will be considered by the Company otherwise.

Foremen and others must not certify to deductions hereon for anything but board, and all statements of deductions must be sent in time to reach the proper official before the pay roll is made—not later than the 2d of each month. If received after that date the account cannot be deducted.

A supply of these blanks will be furnished agents, from whom Boarding Masters can procure the number required by them each month. But in furnishing these blanks, or accepting the same after they have been filled up and certified to, the Company does not assume any liability to such Boarding Masters or others, for the amount specified therein.

In connection with the foregoing, it will be borne in mind by Foremen and others that the Company is not to be burdened with the expense and labor connected with the collecting of board bills, except in those cases where employes cannot otherwise obtain board. It applies, therefore, only to employes temporarily in a neighborhood, such as those engaged on working trains, extra gangs employed in track work, etc., etc.

NAME	WORKED FOR	No. Days Meals or Weeks	At What Rate	Amount		I hereby authorize the amount specified to be deducted from my pay

I hereby certify that the foregoing amounts are correct, and that there is nothing included above except for board.

.....Boarding Master.

.....Station .....19....

CERTIFIED TO AS CORRECT:

..... Foreman

..... Foreman

..... Foreman

PAY ROLL.

FORM 66.

(Form used when Payee appears personally before the Paymaster.)

Received from the.....RAILWAY COMPANY, the sums set opposite our respective names, for Labor for the month of.....19..., and in full for services of every name or nature for said Company, or Companies owned or controlled by it, up to the close of the month named.

No.	Name.	Occupation.	Time.	Rate.	Amount.	Paid on account.	Amount Due.	Received payment in full.	Witness.

NOTE.—The Pay Roll for engineers and firemen and trainmen is the same as the above, except that it contains a column for the "number of miles run," inserted after "occupation."

The pay roll blank of a railway will also answer very well for a time ticket on which to group several names when a number of employes leaves the service simultaneously at a particular point and requires to be paid off: when thus grouped, the clerical work of making out a time ticket for each is avoided. Some railway companies have a special form for this purpose. It is not noticeably different, however, from the pay roll blank (except in unimportant particulars), and so, therefore, it is not necessary to give a separate form of this kind here.

For description of pay roll adapted to those cases where the company pays by check, see the form succeeding this, No. 67.

PAY ROLL.

FORM 67

(Form used when payment is made by Check. The Check being forwarded by the Paymaster.)

PAY ROLL: STATEMENT OF TIME WORKED AND WAGES EARNED BY THOSE NAMED BELOW, WITH DETAILS OF PAYMENT AND OTHER PARTICULARS, FOR MONTH OF.....19....

No.	Name.	Check to be sent to	Occupation.	Time	Rate.	Amount.	Deductions.	Balance.	Deductions made by Paymaster.	Balance to be paid Employe.	HOW ROLL IS PAID. By Time Ticket. If time ticket has been Issued write "Time Given."	HOW ROLL IS PAID. By Check No.

NOTE.—The pay roll for engineers and firemen and trainmen is the same as the above, except that it contains a column for the "number of miles run," inserted after "occupation."

TIME TICKET.

FORM 68.

This certificate is not negotiable and can only be paid by authorized agents of the Company, and under the rules and regulations governing its issuance and payment. It is void if drawn for any sum exceeding $150.00, and unless certified to and countersigned by authorized officials of the Company. It is not good after 30 days from its date. The amount named herein is subject to any claim against the payee.

No.....

Division.....No. of Roll....., ...Station.....19....

Certificate of wages in favor of..... .....

for services as..... .....at.....for.....hours in the month of ..... 19....at rate of $.....per.....amounting in all to ....Dollars, $.....

From this amount deduct.....Dollars, $.....

on account of.....

leaving balance due him.....Dollars, $.....

Why this ticket is issued.....

NOT NEGOTIABLE.

Countersigned:
Name.....
Title.....

I hereby certify the above to be correct:
Name.....
Title.....

NOTE.—This is one of two forms, namely: "Time ticket" and "Record of time ticket issued."
Under the multiplex system these forms are written simultaneously, thus saving the clerical work of re-writing, and insuring absolute accuracy and conformity as between the different documents. For conditions printed on back of ticket, see next page.

[BACK OF TIME TICKET—FORM 68.]

AGREEMENT UPON THE PART OF PAYEE.

This time ticket, upon which payment for wages is made, is accepted by me in full payment for services of every name and nature for the.....Railway Company, or companies owned or controlled by it, up to and including the time specified herein.

It is accepted by me subject to the rules and regulations of the Company governing its issue. I agree not to negotiate it or attempt to collect it through any bank or collection agency, but to present it in person to the Paymaster of the Company, or such agent as may be authorized to pay it.

It is also understood and agreed to by me, as witnessed by my signature hereto, that in the event I should lose this ticket, or it should otherwise pass out of my hands, and in consequence the amount called for should be paid to a wrong person, I will not hold the Company responsible for the amount.

.....

Signature of payee, i. e., person to whom this ticket is issued.

Witness: .....

Title: .....

RULES GOVERNING PAYMENT.

NOTE.—When a time ticket is presented for payment, the payor should require it to be endorsed by the payee. If the endorsement conforms to the signature of the payee written at the time the ticket was delivered to him, it will afford corroborative evidence that the ticket is presented by the proper person. If the payee cannot write and his signature is by mark, in addition to having him endorse the time ticket the payor should require him (if unknown) to be identified by an Identification Blank, properly filled up. When the ticket is sent by the maker to an agent to be paid (and the agreement printed above has not been signed by the payee), it must be accompanied by an Identification Blank, properly filled up, so as to insure the amount being paid to the proper person. If this ticket is not delivered to the payee within THIRTY days from the date hereof, there must be marked across its face, "Canceled—Not Called for"; it should then be forwarded forthwith to the Paymaster for cancelation. Before paying time tickets, agents and others must carefully study the rules and regulations concerning the same.

TIME-TICKET PAY SHEET—RECEIPTS FOR AMOUNTS PAID EMPLOYES LEAVING THE SERVICE IN A BODY. FORM 69

Received from the.....Railway Company the sums set opposite our respective names, for labor for the month of.....19....and in full for services of every name or nature for said Company or Companies owned or controlled by it, up to the close of the month named.

No.	NAME	OCCUPATION	TIME	RATE	AMOUNT	PAID ON ACCOUNT	AMOUNT DUE	RECEIVED PAYMENT IN FULL	WITNESS
	TOTAL,								

Countersigned.....

.....

I hereby certify the above to be correct.....

.....

REQUEST FOR TIME TICKET. FORM 70.

NOT TRANSFERABLE OR NEGOTIABLE.

.....Station, ...19....

To.....

.....

THIS IS TO CERTIFY that.....

Occupation.....at..... .....

is entitled to a time ticket for..... {*hours' / *days'} work

performed by him in the month of.....19...., at

the rate of.....per.....amounting in

all to.....Dollars ($..... .....)

less.....Dollars ($.....)

to be deducted on account of.....

Why this ticket is issued.....

Send the time ticket to.....

.....

.....

.....

*Scratch out days or hours, as the case requires.

NOTE.—This requisition must be presented (or sent) directly to the person to whom it is addressed, whose duty it is to make the time ticket. If the request does not reach such person before the pay roll is sent in (or in time to have the pay roll marked "time given") it will be taken up and destroyed. In order to insure the time ticket being delivered to the proper person, this requisition must be accompanied by an identification blank (form 71) in all cases where the payee is unknown to the person (either the maker of the time ticket or the official to whom it is directed to be sent, as the case may be), who will deliver the time ticket to him.

IDENTIFICATION BLANK. FORM 71.

.....Station, ...19....

To.....

.....

NOTE.—This blank will be written (in duplicate, with carbon) by the Foreman or Timekeeper when it is not practicable to personally identify track laborers and others before the Paymaster or whoever pays them. It must be signed by the person for whom it is made out, and such signature must be witnessed by the Foreman or Timekeeper filling out the blank. The carbon copy is to be retained for an office record by the person making out the blank. The original should be sent with the request for time ticket (when such request is made) in all cases where an employe leaving the service is unknown to the official whose duty it is to give him the time ticket. If the person making out the time ticket does not deliver same to the payee, but sends such ticket to an agent or other official to be delivered, this identification blank must be sent with such time ticket to insure its being delivered to the proper person.

Whenever the payee of a time ticket or letter of advice is unable to write and signs the agreement on such time ticket or letter of advice by his mark, the maker of the time ticket or letter of advice upon delivering same to the payee must also give the payee an identification blank, properly filled up, in order to insure the amount being paid to the proper person.

WHEN PAYMENT IS MADE, THIS CERTIFICATE WILL BE TAKEN UP BY PAYOR.

1. Name of payee.....
2. Nationality.....
3. His age.....
4. Height.....
5. Weight.....
6. Complexion.....
7. Color hair.....
8. Color beard.....
9. Color eyes.....
10. Marks.....
11. Whose crew.....
12. Where working.....

{Signature of payee.....

We hereby certify that the foregoing description of the payee, whose name is signed above, is correct, and same was signed by him in our presence.

{.....Timekeeper.

.....Foreman.

FORM 72

I certify that the pay roll has been marked "Letter Given."

LETTER OF ADVICE TO PAYMASTER IDENTIFYING EMPLOYE.

Conditions of Payment.—This letter is void and of no account unless certified to and countersigned by authorized officials of the Company, and duly endorsed by the person in whose favor it is made. When thus made, the wages it specifies to be due will be paid, if still unpaid (subject to the conditions printed hereon), by the paymaster. It is invalid if not presented and paid within thirty days from the date hereof. The amount named herein is subject to any claim against the payee. This letter is not good for any sum exceeding $50 00.

To whom the letter is to be presented.—Before this letter can be honored by the payment of the wages it specifies, it must be compared with the pay roll, and if found correct, and the amount unpaid, the roll must be marked "letter given" and the fact certified hereon in the place provided. If the pay roll is not in the hands of the paymaster he must refer the bearer to the official of the Company in whose possession it is, who will certify to it. In the event the paymaster or official who certifies to the letter is not in a position to pay it, he will refer the payee to the officer who is.

No..... .....19....

TO THE PAYMASTER: THIS IS TO CERTIFY that the bearer,

.....whose signature is endorsed hereon, appears on the

.....pay roll for.....19...., No..... occupation.....

at.....and that there is due him after making all deductions,

.....dollars. ($.....)
100 100

Why this letter is issued.....

Countersigned:

.....

.....

I hereby certify the above is correct, and that no time ticket has been issued.

.....

.....

NOTE.—This is one of two forms, namely: "Letter of advice to paymaster identifying employe "and "Record of letter of advice to paymaster identifying employe."

Under the multiplex system these forms are written simultaneously, thus saving the clerical work of rewriting, and assuring absolute accuracy and conformity as between the different documents. For conditions of endorsement printed on back of letter, see next page.

[BACK OF LETTER OF ADVICE—FORM 72.]

AGREEMENT UPON THE PART OF PAYEE.

This letter of advice upon which payment for wages is made, is accepted by me in full payment for services of every name and nature for the.....Railway Company, or companies owned or controlled by it, up to and including the time specified herein.

It is accepted by me subject to the rules and regulations of the Company governing its issue. I agree not to negotiate it or attempt to collect it through any bank or collecting agency, but to present it in person to the paymaster of the Company, or such agent as may be authorized to pay it.

It is also understood and agreed to by me, as witnessed by my signature hereto, that in the event I should lose this letter, or it should otherwise pass out of my hands, and in consequence the amount called for should be paid to a wrong person, I will not hold the Company responsible for the amount.

.....

Signature of Payee, i. e., person to whom this ticket is issued.

Witness:.....

Title:.....

ORDER ON PAYMASTER.—NOT NEGOTIABLE. FORM 73.

The company upon which this order is drawn will not be responsible for its payment. It is subject to any claim against the maker upon which process of garnishment has been issued and served upon the said railway company. This order must be certified as correct by some well known and trustworthy person in the employ of the company, who is conversant with the facts and personally acquainted with the signature of the drawer. It will be honored only when drawn for the full amount of the month's pay.

This is to certify that I am personally acquainted with the maker of this order, and am witness to the authenticity of his signature. I know, moreover, that he was employed by the company, as stated.

....Station.....19....

TO THE PAYMASTER:

Pay to bearer the amount due me for services as..... .....

of... .....on company's pay roll, for month of.....19....

This order will not be paid by the company unless the amount shall be found due by it to the drawer on the next pay day, and unless said order is presented at the proper time and place for paying the wages of the person issuing it.

I have marked the pay roll "order given."

... . Paymaster.

....

FORM 74

DISTRIBUTION BLANK FOR LABOR PERFORMED.

Office of_____ at_____ Folio_____

DISTRIBUTION OF LABOR, for the month of_____ 19____

Chargeable to "*Repairs of Freight Cars*" (to illustrate).

(Eyelet)	NAME	KIND OF SERVICE	Folio of time book	Time worked	RATE	Detailed Amount		Total Amount		
(Eyelet)										
(Eyelet)										

NOTE—Blanks of this form are used by storekeepers and other accountants who are required to render returns for labor. A separate heading (*i. e.*, the name of the general account) is opened with each account on which labor has been expended so far as the same is required to be specifically stated by the regulations of the service. The blanks are furnished in loose (detached) sheets so that the person who writes them up may take an impression (or carbon) copy before they leave his hands; this in order to save the clerical work that would otherwise be required in making a written copy. The impression is retained for local use and the original sent to headquarters. The sheets are eyeletted so as to enable the person making the return to collect them together (in due order) and bind them in book form before they leave his hands. Covers (similarly eyeletted) for the books thus formed, are furnished with the blanks. The recapitulation of the accounts charged (to be given in the back part of the book) must be signed by the accountant or storekeeper making the return.

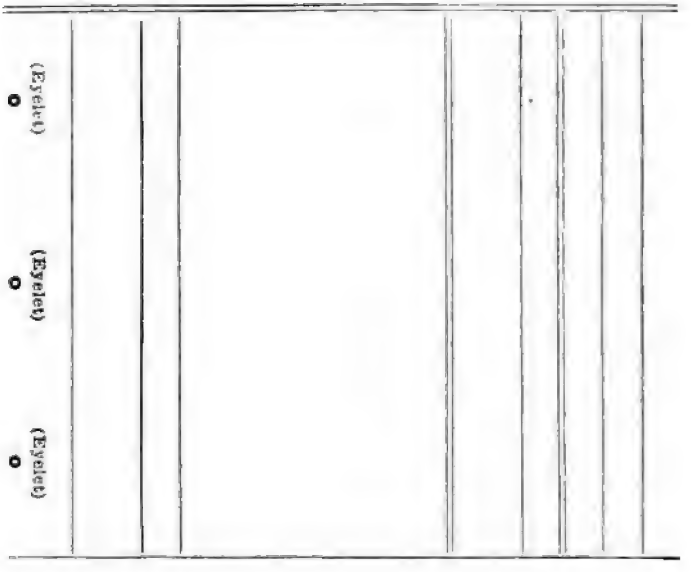
FORM 75

DISTRIBUTION BLANK FOR MATERIAL USED.

Office of_____ at_____ Folio_____

DISTRIBUTION OF MATERIAL, for the month of_____ 19___

Chargeable to "*Repairs of Passenger Cars*" (to illustrate).



NOTE—This form is used by storekeepers and other officials and employes who have charge of material and are required to make return thereof for purposes of accounting and otherwise. A separate heading ("Chargeable to") is opened with each account on which material has been expended so far as the same is required to be specifically stated by the regulations of the service. The blanks are furnished in loose (detached) sheets so that the person who writes them up may take an impression (or carbon) copy before they leave his hands; this in order to save the clerical work that would otherwise be required in making a written copy. The impression is retained for local use and the original sent to headquarters.

The sheets are eyeletted so as to enable the person making the return to collect them together (in due order) and bind them in book form before they leave his hands. Covers (similarly eyeletted) for the books thus formed are furnished with the blanks. The recapitulation of the accounts charged (to be given in the back part of the book) must be signed by the storekeeper or official making the return.

FORM OF RELEASE TO BE SIGNED BY MINORS AND THEIR LEGAL GUARDIANS

NOTE.—This release must be furnished in duplicate by all minors before they are allowed to enter the service of the Company. It must be duly signed by the parents or guardian of the minor, witnessed by two disinterested persons and sworn to before a notary public.

One copy of the release should be kept on file in the office of the official under whom the minor is employed and the other forwarded to the Superintendent of Motive Power and Machinery.

WHEREAS,.....who was .....years of age on the.....day of..... 19...., is about to enter the employment of the ..... RAILWAY COMPANY; and

WHEREAS, the nature of such employment may from time to time be changed:

THEREFORE, IN CONSIDERATION of his being employed by that Company, in whatever capacity now or hereafter we, the undersigned, *father and mother of said minor, do hereby agree with said Railway Company that we have given the said..... .....his own time and earnings, and that he is of sufficient capacity to discharge the duties of his employment, now or hereafter, and that he may at all times himself collect and receipt for his wages from said Company in whatever position he may at any time be employed, and that we will make no claim against said Company at any time for any wages or earnings of said minor in the employment of said Railway Company, or for any injuries that he may receive during or in connection with said employment, or for any liability whatever on account of said minor or his employment.

WITNESS our hands and seals at.....this.....day of .....19.....

Witness:

..... [SEAL.]

....[SEAL.]

*If there is no father or mother and there is a guardian, the word "guardian" should be inserted instead of "father and mother," and the release executed by guardian.

I,..... referred to in the above release, do hereby certify that I was.....years of age on the.....day of.....19...., and that the dangerous nature of the business in which I am about to engage has been explained to me by the agents of the Company, and that I fully understand the risks I am about to take in entering the employment of the .....RAILWAY COMPANY as a .....

Dated at.....this..... .....day of .....19.....

WITNESS:

....

BOND OF INDEMNITY TO BE FILED WITH THE COMPANY IN CASE OF LOST VOUCHERS, TIME TICKETS, CHECKS, DRAFTS AND SIMILAR DOCUMENTS.

FORM 77.

KNOW ALL MEN BY THESE PRESENTS, That we.....of.....as principals, and.....of.....and.....of.....as sureties, are held and firmly bound unto the..... Railway Company, in the penal sum of.....dollars ($.....) lawful money of the United States, to be paid to the said ....Railway Company, its successors and assigns, for which payment, well and truly to be made, we do bind ourselves, our heirs, executors and administrators, jointly and severally, firmly by these presents.

Sealed with our seals, and dated this. .....day of. .....A. D, 19....

The conditions of the foregoing obligation are such that, whereas, on the.....day of..... A. D. 19....the said.....Railway Company did, by..... its.....issue its..... No..... .....for the sum of..... .dollars.....cents, payable to .....

AND, WHEREAS, it is claimed that said.....has been lost, stolen or destroyed, and cannot now be produced by said..... and payment thereof has been stopped.

AND, WHEREAS, at the request of said..... .....and upon his promise to indemnify and save harmless the said Railway Company in the premises, and to deliver said..... ..... when found, to said Railway Company, to be canceled, the said Railway Company is about to issue a duplicate of said ....for the sum of..... dollars and..... .....cents payable to the order of said.....

NOW, THEREFORE, if the above bounden obligors shall well and truly indemnify and save harmless the said..... .....Railway Company, its successors and assigns, from and against said original.....and any and all damages, costs, charges and expenses, and all actions or suits, whether groundless or otherwise, by reason of said original.....or the loss or destruction thereof, and also deliver or cause to be delivered up the same, when and as soon as the same shall be found, to be canceled, then this obligation shall be void; otherwise the same shall remain in full force and effect.

Principal will sign here.....[SEAL.]

Sureties will sign here { ....[SEAL.] ....[SEAL.]

BILL AGAINST INDIVIDUALS, FIRMS AND CORPORATIONS. FORM 75.

Department No.....

.....

19.... To..... .....Railway Company, Dr.

		For				
		Auditor's No.				

I hereby certify that the above account is correct.....

Examined and entered.....

Certified to..... .....

Approved..... ....

Approved ....

NOTE.—The above is one of three forms. The original is sent to the individual, firm or corporation against which it is made, the duplicate (above form) is sent to headquarters and charged on the general books, the triplicate being retained for a record in the office in which it is made.

REGISTER OF VARIOUS PERSONS' BILLS.....19.... FORM 79.

(I. e., bills against individuals, firms and corporations.)

Folio ledger	Audit number	Name	Residence	Description of bill	Total amount	Material		Premium	Fuel	
						Name of account	Amount		Coal	Wood

(Continued).

Operating Expenses						Miscellaneous Accounts (to be specified by name)	Passenger earnings	Freight earnings	Miscellaneous earnings
			Sundry Accounts (to be specified by name)		Divisions and sub-accounts	Outside Roads (operated by Company)				
			Name	Amount						

VOUCHER. FORM 80.

.....Railway Company.

To.....

of.....Dr.

.....19....

For		
AUDIT NO.	I hereby certify that this account is correct:	Approved: ..... General Manager.
Examined and Entered: ..... Auditor.	Certified to: ..... General Superintendent.	Approved for payment: ..... Auditor of Expenditures.

Received.....19....of the.....RAILWAY COMPANY,

the sum of.....Dollars.

($.....), in full for the above account. 100

.....

REGISTER OF AUDITED VOUCHERS, ...19.. FORM 81

Date of Payment			No. of check	Paying No.	Audit No.	Name	Residence	Description of bill		Total amount	Material and Pay Rolls		Fuel		Operating		
Month	Day	Year									Name of shop or store-house	Amount	Coal	Wood	Division of road		

(Continued).

Expenses (i. e., such expenses as can be charged directly from vouchers)												Chargeable to Transportation and Telegraph Companies		General ledger accounts		Passenger discount (earnings)	Freight overcharges (earnings)	Miscellaneous	
											Sundry accounts (to be specified by name)			Name	Amount	Name of account	Amount			Name of account	Amount

FORM 82.

REPORT OF CONSTRUCTION WORK, including Rebuilding, Improvements and Enlargements on.....Division, authorized by.....Order No. .....

NOTE.—When a bridge, culvert, building, dock, wharf, viaduct or other structure is being rebuilt, replaced, improved or enlarged, or when expenditures are to be made on new work of any description, this report must be carefully filled out as per rules printed on the back of this blank.

This report must be forwarded to the accounting officer as soon as the information required can be obtained, and in all cases it should either accompany or precede the first charge.

Location and Description of Old Structure or Work	Cost of Old Structure or Work	Location and Description of New Structure or Work	Estimated Cost of New Structure or Work	Date of Commencement of New Work	Probable Date of Completion of New Work

Signed.....

(Back.)

RULES GOVERNING THE USE OF THIS BLANK.

LOCATION AND DESCRIPTION OF OLD STRUCTURE OR WORK.—In the column with above heading should be entered the number of each bridge or culvert and the name of the station nearest which it is located; also name and location of each building, dock, wharf, tunnel or other structure about to be rebuilt, enlarged or improved. A description of the materials of which the old structures are built, and what disposition is to be made of old build-

FORM 82—CONTINUED.

ings, should be noted in every instance. When only a portion of a structure is to be rebuilt or replaced, a full description of such part should be given.

COST OF OLD STRUCTURE OR WORK.—In the column with above heading should be entered the estimated cost of replacing the structure specified with one substantially the same as the old one. When only part of a structure is to be rebuilt or replaced, then only the estimated cost of such part should be given.

LOCATION AND DESCRIPTION OF NEW STRUCTURE OR WORK.—In the column with above heading should be entered a description of the materials of which the new structure is to be built, and full information given necessary to determine whether the work is in the nature of a permanent improvement to the property of the company, or merely a replacement. If a new structure is built where none existed before, or if the new work is entirely in the nature of an improvement of or an addition to the old structure, the fact must be stated. In all cases the number of the order authorizing the new work should be given.

In this column should also be entered a description of construction works, as follows, viz:

Block Signals,
Fences,
Road Crossings and Signs,
Telegraph and Telephone Lines.
} Give names of stations between which the work is located.

Sidings—Give location and length of each.

Interlocking Switches—Give location of each group.

Shop Machinery and Tools—Give description and location.

Second Tracks,
New Lines and Extensions,
Improvements on account of ballasting, raising grade, widening embankments, filling bridges and trestles, riprapping, and kindred work.
} Give full description and location.

ESTIMATED COST OF NEW STRUCTURE OR WORK.—In the column with above heading should be entered the estimated cost of each structure or work described in the preceding column, and the name of the official furnishing the estimate.

DATE OF COMMENCEMENT OF NEW WORK.—In this column should be entered the month in which the new work reported on this form will be commenced.

PROBABLE DATE OF COMPLETION OF NEW WORK.—In the column with the above heading should be entered, as nearly as possible, the date on which the structure or work will be practically finished.

This blank must be signed by the official making the return, and should accompany or precede the first charges in the distribution books on account of same.

FORM 83

MONTHLY COMPILATION OF EXPENDITURES FOR TRACK LABOR, FOR THE INFORMATION OF OPERATING OFFICERS.

NOTE.—The purpose of these statistics is to make comparisons of cost for the different divisions and subdivisions of the road. The table should include all men employed on sections, working trains and those otherwise engaged in connection with the track, as per the several headings. The information is compiled monthly from the time book of track labor (given elsewhere herein). At the bottom of this sheet the totals should be shown for the current month, and below these the totals for the same month of the previous year, the increases or decreases being given underneath.

DIVISIONS OF THE ROAD	SUBDIVISIONS OF THE ROAD	Miles of Track and Certain Sidings	Number of Men Employed per Mile of Track, (Excluding Bridge Watchmen and Flagmen at Crossings)		Total Cost	Total Average Cost per Mile	"REPAIRS OF ROADWAY."										Average Cost per Mile for "Repairs of Roadway."
			Corresponding Month, Previous Year	Current Month			Laying Rails	Laying Ties	General Repairs of Track	Ballasting	Filling Bridges and Culverts	Cleaning Out Ditches	Clearing Track of Snow and Cutting Weeds	Track Watchmen	Frosbet Repairs		

"Superintendence, Maintenance of Way and Structures"	"Repairs of Interlocking Plants."	"Repairs of Block Signals"	"Repairs of Bridges and Culverts"		"Repairs of Fences, Road Crossings, Signs and Cattle Guards"	"Flagmen"	"Clearing Wrecks"	"Laborers at Stations"	"Maintaining Telegraph"	Unloading Coal into Storage	Unloading Wood into Storage	"Fuel for Locomotives"	Loading Cinders at Cinder Pits	CONSTRUCTION										Miscellaneous
			General Repairs of Bridges and Culverts	Bridge Watchmen											Ballasting	Rectifying Grades	Widening Embankments and Cuts	Ditching	Fences	Road Crossings and Signs	Telegraph	Side Tracks	Block Signals	Interlocking Plants	

FORM 84. REPORT OF TRAVELING AUDITOR.

ACCOUNTING DEPARTMENT.

(CONFIDENTIAL.)

Report of Examination of.....Shop,

made.....19...., by..... .....

1. STOREKEEPER AND ASSISTANTS.

NAME	Nature of Duties	Age	Married or Single	Salary		Length of Time in Service of Company	Remarks
.....	.....	...	.....	...	...	.....	.....
.....	.....	...	.....	...	...	.....	.....
.....	.....	...	.....	...	...	.....	.....
.....	.....	...	.....	...	...	.....	.....
.....	.....	...	.....	...	...	.....	.....
.....	.....	...	.....	...	...	.....	.....
.....	.....	...	.....	...	...	.....	.....
.....	.....	...	.....	...	...	.....	.....
.....	.....	...	.....	...	...	.....	.....
.....	.....	...	.....	...	...	.....	.....

2. What are the office hours?.....

3. Has each employe in Storekeeper's office filled out the usual form of agreement, and has it been forwarded to the general accounting officer for file? If not, please have it done forthwith. .....

4. Has each employe at this storehouse—employed in office, storeroom or elsewhere—who is not yet twenty-one years of age, been required to furnish a Minor's Release, and has it been forwarded to the General Storekeeper for file? If not, please have it done forthwith.....

5. What effort is made by the Storekeeper to familiarize the clerks in his office with the general duties and various classes of work connected with the storehouse, so that they will be fitted for advancement?.....

FORM 84—CONTINUED.

6. Has the Storekeeper any one in his employ performing clerical work of any kind who is carried on the pay roll as "laborer," or who is paid by an hourly or daily rate? If so, state circumstances and nature of work in detail.....
7. Is there any way to reduce the expense of accounting or handling material at this shop?.....
8. Can the Storekeeper's force be reduced in any way?.....
9. Are the wages paid too high?.....
10. Do the Storekeeper and his assistants keep the accounts in a systematic and neat manner?.....
11. Does the Storekeeper keep a record of all statements required of him, showing to whom sent, date when due and date sent forward, and is it posted up each month?.....
12. Are all changes in the Rules and Regulations entered in their proper place in each copy of same in the office?.....
13. Does the Storekeeper keep a "Circulars Received" book, and is it kept posted up?.....
14. Are all orders and requisitions for material, records of time tickets, pay rolls and other records of the office filed away systematically and kept in a safe place, convenient for future reference?.....
15. Are there any old books or records no longer of use at this shop? .....
16. Does the Storekeeper keep a copy of all letters, reports and statements sent from his office?.....
17. Are invoices properly entered in the record book of "Material Received?".....
18. Are the pay rolls, time books and material and labor distribution books outlined and written up as far as practicable before they are needed, and is all regular work anticipated as much as possible?.....
19. Does the Storekeeper keep a record book for material in course of manufacture, showing exact amount of labor and material expended on each article manufactured?.....
20. Does he have a price list, covering all items in stock, and are corrections promptly made in same as the prices change? .....
21. Is the cost of material manufactured at this shop carefully computed, and are the prices on such material promptly posted in the price list?.....
22. Does the Storekeeper rigidly enforce the rules in regard to keeping shop time? If not, in what particulars does he deviate? .....

FORM 84—CONTINUED.

23. What is the custom when the shop timekeeper does not find employes on hand at commencement of work or at a quarter time?.....

24. What is the practice in keeping the time of men regularly employed at night and at other times when the timekeeper is absent?.....

25. What is the practice in keeping account of overtime, and on what basis is it allowed? .....

26. Has the Storekeeper any small shops or roundhouses subordinate to this one, the pay rolls or material distribution for which are made in this office? If so, give the name of such shop or shops.....

27. How is the time of men employed at such shops reported and certified to him?.....

28. How often are the time books of men employed at sub-shops forwarded to him during the month?.....

29. How often does he receive statements of material used at such shops?.....

30. Are *all* engineers' trip reports checked with the daily reports of train movements from the train dispatcher before the time claimed is allowed?.....

31. Are *all* switching engineers' time slips checked with the engine house register before the time claimed is allowed?

.....

32. Are pay checks delivered to each employe personally by the person to whom they are sent for distribution, or if this is impracticable, by responsible representatives, noway concerned in making or certifying to the rolls?.....

33. Are the engineers' and firemen's time books both written up directly from the engineers' time slips and trip reports?

.....

34. After the time slips and trip reports are entered in the time books, is the firemen's book checked against the engineers' book to see that the time is correctly allowed in both books? .....

35. Is all time on the engineers' and firemen's time books which is not correctly chargeable to the account "Engineers and Firemen" carefully drawn off from the time books each month and charged to the proper accounts? (These time books contain time testing engines just out of shops, time of dispatchers, and other time not correctly chargeable to "Engineers and Firemen," and this time must be charged to the proper accounts in the labor book).....

FORM 84—CONTINUED.

36. When engineers and firemen run over two or more divisions how is the mileage made on each division designated in the time books?.....
37. Are expenses for engine service on account of work trains invoiced promptly to the proper officials?.....
38. When were such invoices for the month of..... forwarded? .....
39. How many errors in allowing time were made during the month of.....
    Shop time: Overallowed.....
    Underallowed .....
    E. and F. time: Overallowed.....
    Underallowed .....
40. Are the storehouse and grounds kept clean and orderly? .....
41. Is the material so arranged in the yard and outhouses as to protect same from weather, and so that any abstraction therefrom would come to the storekeeper's notice?.....
42. Is the material arranged in the store-room systematically, with a view to convenience in handling, and to facilitate counting the stock for the monthly requisition and annual inventory? .....
43. Are the stock books written up in accordance with the location of the material, so that the quantity of stock on hand can readily be entered in the books, and the requisition easily written therefrom? .....
44. Does the Storekeeper receive a proper order in each instance for material and fuel disbursed by him?.....
45. Whose signature does the Storekeeper accept on orders for material? .....
46. Does the Storekeeper accept orders for material which are signed with a rubber stamp?.....
47. Are the rules in regard to the return of old tools, brasses, implements, utensils, etc., when new ones are supplied, rigidly enforced at this shop?.....
48. Who passes upon the sufficiency of the reasons given when old tools, etc., are not presented in exchange, before issuing such supplies?.....
49. What precautions are taken to prevent coal and wood from being stolen or wasted?.....
50. What means are employed to guard against leakage, evaporation and loss of oils?.....
51. What is the practice in handling, storing and shipping oil in barrels?.....

FORM 84—CONTINUED.

52. When were the tanks in the oil house thoroughly cleaned last? Car..... Engine.....
Valve..... Signal.....
Kerosene .....

53. What precautions are taken to guard against fire in the storehouse and outbuildings?.....

54. What provision is made for the disbursement of supplies at night? .....

55. Is there any scrap or surplus material on hand? (If so, send list to the General Storekeeper, attaching copy of same hereto).....

56. Did you go through the stock books carefully with the Storekeeper before answering the foregoing question?.....

57. Is scrap material carefully picked up, assorted and disposed of in the proper manner?.....

58. What is the practice in caring for brass and copper scrap?
.....

59. Does the Storekeeper personally inspect scrap to see if any usable material is thrown in with same? If so, how often?
.....

60. Does he keep a record book showing the daily accumulation of scrap and the source thereof, so that at the end of the month the proper accounts may receive credit?.....

61. Are requisitions on the General Storekeeper promptly filled?
.....

62. In the event necessary requisitions are not promptly filled, state any losses the company suffers in consequence.....

63. Is the Storekeeper careful to see that all material received is according to the requisition and that it checks with the invoice before accepting the invoice?.....

64. Is he careful to examine each article as to quality?.....

65. Does he promptly notify the forwarding storekeeper in case he discovers errors in quantity, quality or price of material received? .....

66. Does he personally examine each lot of material as received—to ascertain whether properly packed, loaded and stowed in car, in order that the material may not be damaged in transit, and does he take up at once with the proper official any case of apparent carelessness in this regard?.....

67. Does he carefully inspect lumber and other material received directly from dealers, rejecting such as is not up to specifications, and deducting same from invoices therefor?
.....

FORM 84—CONTINUED.

68. How often does the Master Mechanic or Chief go through the stock with the Storekeeper with the view of keeping the quantity of supplies in stock at the minimum?.....

69. When was this done last?.....

70. After the monthly requisition has been made by the Storekeeper, does the Master Mechanic or Chief go over same with him, item by item, before signing it?.....

71. When material is shipped from the storehouse does the Storekeeper personally inspect the cars after loading, in order to see that the material is properly packed and stowed in the cars, in order to prevent loss or damage in transit? .....

72. How often does the Storekeeper visit outside places on his division, and what is his plan of investigation on such trips? .....

73. Does the Storekeeper take proper measures to see that the value of material on hand corresponds—substantially—with the balance as shown by his record of receipts and disbursements at the close of each month?.....

74. Are station and section supplies disbursed from a supply car each month, and is the stock on hand at stations and elsewhere examined by the man in charge of the supply car before the material ordered is delivered?.....

75. How much of the Storekeeper's division is covered by the supply car each month?.....

76. How often does the Storekeeper personally go with the supply car? .....

77. When did he go last, and how much of his division did he cover with same?.....

78. Does the Storekeeper understand that no material is to be sold or labor performed for any employe or outside party without orders from an authorized officer of the company? .....

79. Does he understand that in case any material is sold to or labor performed for any employe or outside party, that the cash must be collected at the time, when practicable, and forwarded to the Second Vice-President's office by express without delay? .....

80. Does he understand that in the event of any irregularities being discovered by him, it is his imperative duty at once to advise the Second Vice-President?.....

81. Did it come to your knowledge that there are any unauthorized or irregular practices indulged in at this shop? If so, state them in detail.....

FORM 84—CONTINUED.

82. Did it come to your knowledge that there were any differences between the Storekeeper and his assistants and the Master Mechanic or Foreman that would tend to injure the service? If so, state the facts.....

83. Is the Storekeeper intelligent, energetic, attentive to his duties, and alive to the necessity of constant vigilance? .....

84. Is his staff composed of honest, faithful and capable men, fitted for the position they occupy?.....

85. Are the Storekeeper and his assistants well versed in and do they practice the rules contained in the Hand Book of Expenditures?.....

86. Did you give the Storekeeper full and minute instructions in every case wherein as shown by the foregoing you found him negligent or at fault?.....

87. GENERAL REPORT.

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NOTE.—This report should, if possible, be made by the Examiner before leaving the storehouse. All answers to the foregoing questions should be made only after the Inspector has assured himself by personal examination that the facts are exactly as stated. In the General Report such facts must be given as may be judged necessary to a full and complete knowledge of the Storekeeper's character and record; to a general understanding of the state of affairs at this storehouse; also such observations as may be useful for reference or as a guide to future examinations.

FORM 85

SECTION FOREMAN'S PRELIMINARY REPORT OF DAMAGE TO PROPERTY BY FIRE

_____Station_____190____

TO THE MASTER MECHANIC:

_____Station.

Engine No._____hauling train No._____ set fire_____

miles_____of_____Station, on the_____day

of_____190____at_____o'clock_____M. The fire

seemed to come from the SMOKE STACK or ASH PAN.*

This engine set_____fires on my Section that day.

_____Foreman Sec. No._____

*If from ash pan run your pencil through the other, etc.

NOTE: When a fire is discovered by a sectionman, which appears to have been started by an engine, notice should be given immediately on the above blank, to the nearest Master Mechanic or Roundhouse Foreman, who will have the engine promptly inspected and report cor dition of same to the General Officer in charge of Claims, said report to be accompanied with this notice.

FORM 86

SECTION FOREMAN'S REPORT OF DAMAGE TO PROPERTY BY FIRE.

Section Foremen will make a report on this bank of all fires started by this Company, which do any damages, answering each question fully, and return it promptly to the Division Roadmaster, who will forward it to the Division Superintendent, who will in turn forward it to the Claim Agent. Particular attention should be paid as to whether the fire caught on or off the Company's right-of-way, the condition of the right-of-way as to dry grass, leaves or other combustibles, and the facts must be fully stated in this report. Every effort should be made to ascertain correctly the actual loss. A separate report should be made for each owner of property.

1. On the.....day of.....190...., at.....o'clock.....Day or Night.....
   On Sec. No.....miles (east, west, north or south) of.....
   The nearest station.....between mile posts.....and.....
   Property burned belonging to.....
   of..... County of.....State of.....
2. Name of tenant, if rented, and his interest in property.....
3. Give full and complete list and description of property burned.
   (If grain, meadow or grass, number of acres, kind of grass and value; if hay, millet or straw, number and size of ricks or stacks, number of acres from which cut, number of tons and value; if fence, length and full description; if trees, number, kind, age and size, with number of acres burned over, etc. If any other property give detailed description. Foremen should measure at once the length and width of stack and also estimate height. When corn or meadow is burned the ground should be measured.)
   .....
   .....
   .....
   .....
   .....
   .....
   .....
4. Estimates of loss: Section Foreman's, $.....Owner's, $.....
5. No. of train starting fire....., Engine No.....(freight or passenger)?.....
6. Was train going up or down grade?.....
7. Condition of right-of-way at time of fire, whether covered with weeds, dry grass or combustible material.....
8. When was right-of-way last burned off or grass cut?.....
9. Did fire start on right-of-way or on outside?.....
10. On which side of track did fire start?.....
11. If fire did not start on right-of-way, how near to center of track did fire approach?.....
12. Distance from center of track to where fire started?.....feet.
13. How far from center of track to where property burned?.....
14. Do you think that the fire was started by train?.....
15. Was wind blowing?.....; if so, high or low?.....from what direction?.....
16. Number and class of train last passing before the fire?.....
    what time did it pass?.....
17. What effort was made to put the fire out, and by whom?.....
    .....
    .....
18. Name and postoffice address of witnesses who saw fire start?.....
    .....
    .....
19. Who was first at the fire?.....
20. Where were section men at time of fire?.....
21. How soon did they get to the fire after it started?.....
22. What is foreman's opinion as to origin of fire?.....
    .....
23. Was there any other fire burning near the property?.....
24. Did this engine set other fires on this trip within your knowledge; if so, when and where?.....
25. Give names of your section men.....
    .....
26. State fully any other facts known.....
    .....
    .....

Section Foreman, Section No.....at.....Station.

FORM 87

SECTION FOREMAN'S REPORT OF STOCK KILLED OR INJURED.

Section Foreman will make report on this blank, of all accidents in which stock is killed or injured, answering each question fully, and return it promptly to the Division Roadmaster, who will forward it to the Division Superintendent. Particular attention should be paid as to whether the accident occurred on a public crossing or inside of the right-of-way, the condition of the fences, gates and cattle guards, and the actual value of stock killed or injured. A separate report should be made for each owner of stock.

1. On the.....day of.....19 ...., at about.....o'clock....M., Daylight or dark.....On Section No.....about.....miles (state direction).....of.....Station, Engine No.....
Engineer.....hauling Train No.....(state whether passenger or freight train).....Conductor.....struck and killed or injured the following stock: (State number and kind. Describe stock and nature of injuries.)
2. .....Weight.....Lbs.....Years old
.....“ ..... “ “ “
.....“ ..... “ “ “
.....“ ..... “ “ “
3. Belonging to.....
4. Whose Post Office address is.....
5. Amount of damage claimed $.....I estimate damage at $.....
6. Was the stock struck on a public highway crossing?.....
7. Were cattle guards and fences leading to guards on both sides of highway in perfect order?.....
8. How long constructed, and were guards pit or surface?.....
9. Was the stock struck on depot grounds, between switches, or between switch and cattle guard?.....
10. How did the stock get upon the track, and through whose negligence?.....
11. Is the right-of-way fenced on both sides of track?.....
12. In what condition is fence?.....
13. If out of repairs, state in what particular, and how long it has been so, and your reason for not repairing it.....
14. What is height of fence?.....feet.....inches
15. Of what material is fence; how many wires or boards? (Barbed or flat wire?).....
16. How long has fence been built and when last repaired?.....
17. If the stock got upon right-of-way at a private crossing, what was the condition of the gates or bars at time of accident?.....
18. Who discovered the gate open after accident occurred?.....
19. By whom was gate closed after accident occurred?.....
20. When was the last time you passed point where stock got upon right-of-way before accident?.....
21. Were the gates or bars then closed?.....
22. Was the fence in perfect order?.....
23. Did accident happen at point where track was straight; if so, for what distance before stock was struck?.....
24. Was the grade up or down, and for what distance from point of accident?.....
25. In your judgment, how far could engineer or fireman have seen stock before reaching point of accident?.....
26. Who disposed of the carcass and hide?.....
27. How much was received for the carcass and hide, and who received the money?.....
28. If you know of any person who witnessed the accident, other than the trainmen, give name and address.....
29. Give any other information you can relating to this accident that you think will be of value to the Company.....
30. What does owner claim as to how and where stock got on the right-of-way?.....

NAME.	RESIDENCE.	
.....	.....	Section Foreman.
.....	.....	Name and Residence of men employed on Section at time of Accident.
.....	.....	
.....	.....	

Dated at.....19 ....

NOTICE.—Section Foreman will fill this blank, and answer all questions in all cases when stock are killed or injured on his section, whether in his opinion the Company is liable or not, and forward the same promptly to Roadmaster of Division.

(Back of "Section Foreman's Report of Stock Killed or Injured."—Form 87)

DUTIES OF SECTION FOREMEN IN REFERENCE TO STOCK KILLED OR INJURED.

When stock has been killed or injured on a section, the section foreman should, if possible, notify the owner and request him to take charge, and assist him in removing dead or crippled stock if requested.

When the stock is injured so badly that the carcasses and hides are unfit for use, or when owner refuses to take charge of them, the section foreman should bury them.

Should stock killed or injured have been removed before the foreman is informed of the accident, he must not fail to make a report, being particular to give name and address of informant.

When passing over his section, if gates are found open or bars down, he should close them whether there is stock in pasture or not.

If owners of land adjoining right-of-way make it a practice or insist upon leaving the gate open or bars down at their private crossings, or pasture stock upon Company's right-of-way, he should notify the Roadmaster, giving full particulars.

In event stock is killed or injured, the foreman should ascertain from owner (and otherwise) how and where stock got on the right-of-way.

When stock gets upon the right-of-way by breaking through Company's fence, the section foreman must personally examine the fence, and thoroughly post himself as to the nature of the break, and make close examination for tracks of animals; also at gates or bars.

Section foremen must not state to owner of the stock their opinion as to what proportion of the value of stock will be allowed by the Company, or admit any liability whatever.

When owners of stock killed or injured make inquiry as to how they shall proceed, the foreman should inform them that to insure a prompt adjustment of their claims they must communicate direct with the superintendent.

APPENDIX E.

LIST OF OPERATING EXPENSES THAT EMBRACE MORE OR LESS ITEMS THAT ARE COMMON TO ALL DIVISIONS OF A RAILROAD THAT IS OPERATED AS A WHOLE.

MAINTENANCE OF WAY AND STRUCTURES.

1. Repairs of roadway.
1. Renewals of rails.
1. Renewals of ties.
1. Repairs and renewals of bridges and culverts.
1. Repairs and renewals of buildings and fixtures.
1. Repairs and renewals of fences, road crossings, signs, etc.
1. Repairs and renewals of docks and wharves.

} 1. Outlay at great terminals and at general repair shops.

Repairs and renewals of telegraph (of a general nature).
Stationery and printing (of a general nature).
Other expenses (of a general nature).

MAINTENANCE OF EQUIPMENT.

Superintendence.
Repairs and renewals of locomotives.
Repairs and renewals of passenger cars.
Repairs and renewals of freight cars.
Repairs and renewals of work cars.
Repairs and renewals of shop machinery and tools.
Stationery and printing (of a more or less general nature).
Other expenses (of a more or less general nature).

CONDUCTING TRANSPORTATION.

Superintendence.
2. Engine and roundhouse men.
2. Fuel for locomotives.
2. Water supply for locomotives.
2. Oil, tallow and waste for locomotives.
2. Other supplies for locomotives.

} 2. Joint service on two or more divisions; switching at great terminals, etc.

Train service.
Train expenses and supplies.
Telegraph expenses.
3. Station service.
3. Station supplies.
3. Switchmen, flagmen and watchmen.
3. Switching charges—balance.

} 3. Great terminals; joint division stations, etc.

Car mileage—balance.
Hire of equipment—balance.
Loss and damage.
Injuries to persons.
Advertising.
Outside agents. (Wages, rent and expenses of the offices.)
4. Rent of buildings and other property. 4. Rent of general offices, etc.
Stationery and printing (of a more or less general nature).
Other expenses (of a more or less general nature).

GENERAL EXPENSES.

Salaries of general officers.
Salaries of clerks and attendants (general office).
General office expenses and supplies.
Insurance (of a more or less general)
Law expenses (of a more or less general nature).
Stationery and printing (general office and similar outlays).
Other expenses (general office and similar outlays).

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